ZAMEEN ARX (MIXED-USE) BY M/S ZAMEEN RESIDENCE (SMC-PRIVATE) LIMITED

Plot No 2B-30, BUSINESS BAY II, CBD PUNJAB, Lahore

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

DECEMBER 2024

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LIST OF ACCRONYMS

EA	Environmental Approval
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Agency –Punjab
EPC	Environmental Protection Council
GOP	Government of Pakistan
GRM	Grievances Redress Mechanism
HSE	Health Safety & Environment
IEE	Initial Environmental Examination
LAA	Land Acquisition Act
MSW	Municipal Solid Wastes
NOC	No Objection Certificate
O&M	Operation and Maintenance
OHS	Occupational Health and Safety
Pak–EPA	Pakistan Environment Protection Agency
PEPA	Punjab Environmental Protection Amendment Act
PEPC	Pakistan Environment Protection Council
PEQS	Punjab Environmental Quality Standards
PIU	Program Implementation Unit
PKR	Pak Rupees
PPE	Personal Protective Equipment
RNR	Renewable Natural Resources
SFA	Social Framework Agreement
HSE	Health Safety Equipment
WAPDA	Water and Power Development Authority

DETAILS OF THE PROJECT

Name of Project:	Zameen ARX (Proposed Mixed-Use Building) By Zameen Residences (SMC-PVT) Limited
Address of Project:	Plot No 2B-30, Business Bay II, CBD Punjab, Lahore
Name & Address of Proponent / Owner	**Mr. Muhammad Adil Ahmad kamal** **Address: House No.264-A, Muhammad Ali Johar Town, Lahore, Pakistan** **CNIC:** 31202-9247547-3
Nature of Project	Mixed-Use Building
Total area of Project	As per layout plan area of the plot is 40000 Sft. Project having, four basement, ground floor up to 33rd floors including one service floor at 16th floor, of above cited plot. Project having apartment building offices, commercial mall, simple apartment, restaurant and office. Parking area allocated for vehicles. However, the cost of project is 1400 million.
Proposed Covered Area	As per layout plan total covered area of building is 40000 SF. Details are mentioned in the location map.
Height of Building	419 Feet
Location of Project with GPS Coordinates	Latitude **31.493253°"N** and Longitude **74. 347476°"E** (Google map attached)
Status of Area	Non-Negative.
Land Use in surrounding of the Project:	Surrounding land near the captioned project is either residential or commercial.
North:	Building
South:	Railway Track

East:	Road
West:	Building
Project Cost:	As per EIA approximately 1400 million PKR.
Raw Material	N/A
Product:	N/A
By-Product	Nil
Type of Waste	Solid Waste, Sewerage waste water
Quantity of Waste	N/A.
Description of Proposed Project	As per EIA report the project is construction of Zameen ARX (Proposed Mixed-Use Building) By Zameen Residences (SMC-PVT) Limited at Plot No 2B-30, Business Bay II, CBD Punjab, Lahore. Proponent has submitted a constructional plan according to Project having four basement, ground floor up to 33rd floors including one service floor at 16th floor, of above cited plot. Project having commercial building offices, hotel rooms, commercial mall, simple apartment, restaurant and office will be constructed further at the site of the plot.
Nearby Emergency Services I.e. Hospital, Police station, Fire-Bridge, rescue.	Nearby Hospital, Police Station, fire brigade & rescue are within the radius of 01-03 KM of the project site.

EXECUTIVE SUMMARY

The project is a high-rise multi-use development that includes a variety of facilities designed to cater to diverse needs. Over the last few years, the number of commercial buildings in Lahore has suddenly increased. This boom in high-rise commercial buildings highlights a major cultural shift among the younger residents of the bustling city. However, Lahore remained more or less indifferent to this growing culture – until recently

Much like the rest of the country, the population of Lahore has seen immense growth. From 6.3 million people in the 1998 census to its current official standing at 11.12 million according to the 2017 census, the number of people living in the city has almost doubled. This is largely due to the fact that people from other parts of the country have begun to move here for better education and job opportunities. However, the city's boundaries have not been pushed enough to accommodate its inhabitants.

The present project proposed is **Zameen ARX (Proposed Mixed-Use Building) By Zameen Residences (SMC-PVT) limited** which is endeavoring to come with the similar aims in their business establishment.

This mixed-use development maximizes the utility of the plot by integrating residential, commercial, and hotel rooms, making it a significant addition to the urban landscape. Its design promotes accessibility, caters to a broad range of users, and enhances its value. The inclusion of a service floor and shared amenities also reflects an emphasis on efficient operations and sustainable building practices.

I. TITLE AND LOCATION OF PROJECT

Zameen ARX (Proposed Mixed-Use Building) By Zameen Residences (SMC-PVT) Limited

Location: Plot No 2B-30, Business Bay II, CBD Punjab, Lahore

NAME OF PROJECT PROPONENT

Proponent: Mr. Muhammad Adil Ahmad kamal

Address: House No.264-A, Muhammad Ali Johar Town, Lahore, Pakistan

II. PROJECT CONSULTANTS

Integrated Environment Consultants

Office: 218 Upper Mall Scheme, Lahore

Phone: +92 42 37897273

Email: *inenvconsultants@yahoo.com*

III. BRIEF OUTLINE OF PROJECT

The proposed site of the project is located at Plot No 2B-30, Business Bay II, CBD Punjab, Lahore. The project in its vicinity has infrastructure like, electricity, telephone, and even the environment is of ideal condition for the construction of residential building. The total area of the proposed plot is 40,000 Sft. Project having four basement, ground floor up to 33rd floors including one service floor at 16th floor, of above cited plot for commercial activities. However, the cost of project is 1400 million, Section attached). The area statement of the project is as following:

Table 0.1 Area Statement (Building Plan)

PARKING					
FLOOR	**PLATE AREA**	**F.A. R**	**USEABE**	**CARS PROVIDED**	**CARS PROVIDED (STACK)**
BASEMENT 4	31,926	-	-	56X2=112	112
BASEMENT 3	31,926	-	-	54X2=108	108
BASEMENT 2	31,926	-	-	54X2=108	108
BASEMENT 1	31,926	-	-	54X2=108	108
TOTAL	127,704	CARS REQUIRED=435		CARS PROVIDED=436	436
BIKE CALCULATION		(436X1280) X 0.16=8929/1595 BIKES		BIKES REQUIRED 595	BIKES PROVIDED 628
COMMERCIAL MALL					
FLOOR	**PLATE AREA**	**F.A. R**	**USEABE**	**NONUSEABLE**	**CARPET AREA**
GROUND FLOOR	23,296	16,859	17,908	5,388	3,437
1ST FLOOR	22,868	19,35	19,392	3,476	12,090

2ND FLOOR	23,295	19,562	19,819	3,476	9,587
TOTAL	69,459	56,356	57,119	12,340	27,114
PARKIN CALCULAION		1 CAR PER 800(CARPET AREA) (MALL)=17527 SFT 1 CAR PER 500(CARPET AREA) (F.C) =9587 SFT		CARS REQUIRED=41	CARS PROVIDED=41
OFFICES					
FLOOR	**PLATE AREA**	**F.A. R**	**USEABE**	**NONUSEABLE**	**CARPET AREA**
3RD FLOOR	23,344	20,293	20,379	2,965	14,420
4TH FLOOR	23,344	20,293	20,379	2,965	14,420
5TH FLOOR	23,344	20,293	20,379	2,965	14,420
6TH FLOOR	23,344	20,293	20,379	2,965	14,420
7TH FLOOR	23,344	20,293	20,379	2,965	14,420
8TH FLOOR	23,344	20,293	20,379	2,965	14,420
9TH FLOOR	23,344	20,293	20,379	2,965	14,420
10TH FLOOR	23,344	20,293	20,379	2,965	14,420
TOTAL	186,752	162,344	163,032	23.720	115,360
PARKIG CALCULATION		1 CAR PER 1000 (CARPET AREA) =115,360 SFT		CARS REQUIRED=115	CARS PROVIDED=115
HOTEL APARTMENTS					
FLOOR	**PLATE AREA**	**F.A. R**	**USEABE**	**NONUSEABLE**	**-**
11TH FLOOR	22,247	19,873	20,063	2,184	-
12TH FLOOR	22,073	19,699	19,889	2,184	-
13TH FLOOR	22,073	19,699	19,889	2,184	-
14TH FLOOR	22,073	19,699	19,889	2,184	-
15TH FLOOR	22,073	19,699	19,889	2,184	-

TOTAL	110,539	98,669	99,619	10,920	-
PARKIG CALCULATION		1 CAR PER 6 ROOM (HOTEL APARTMENTS) =104/6=17 CARS +35 CARS AMENTIED		CARS REQUIRED=52	-
APARTMENTS					
FLOOR	**PLATE AREA**	**F.A. R**	**USEABE**	**NONUSEABLE**	**CARPET AREA**
17TH FLOOR	22,073	19,699	19,889	2,184	14,013
18TH FLOOR	22,073	19,699	19,889	2,184	14,013
19TH FLOOR	22,073	19,699	19,889	2,184	14,013
20TH FLOOR	22,073	19,699	19,889	2,184	14,013
21TH FLOOR	22,073	19,699	19,889	2,184	14,013
22TH FLOOR	22,073	19,699	19,889	2,184	14,013
23TH FLOOR	22,073	19,699	19,889	2,184	14,013
24TH FLOOR	22,073	19,699	19,889	2,184	14,013
25TH FLOOR	22,073	19,699	19,889	2,184	14,013
26TH FLOOR	22,073	19,699	19,889	2,184	14,013
27TH FLOOR	22,073	19,699	19,889	2,184	14,013
28TH FLOOR	22,135	19,761	19,951	2,184	13,860
29TH FLOOR	17,967	15,593	15,783	2,184	9,576
30TH FLOOR	22,135	19,761	19,951	2,184	13,860
31TH FLOOR	17,967	15,593	15,783	2,184	9,576
TOTAL	323,007	287,397	290,247	32,760	201,015
PARKIG CALCULATION		1 car per 1000 (CARPET AREA) (APARTMENT) =201,015 SFT		CARS REQUIRED=201	CARS PROVIDED=201
RESTAURANT AND OFFICE					

FLOOR	PLATE AREA	F.A. R	USEABE	NONUSEABLE	CARPET AREA
32ND FLOOR	22,073	19,699	19,888	2,185	16,288
33RD FLOOR	22,073	19,699	19,888	2,185	-
PARKIG CALCULATION		1 car per 1000 (CARPET AREA) (OFFICE) =5,930 SFT 1 car per 1000 (CARPET AREA) (F.C) =10358 SFT		CARS REQUIRED (OFFICE) =6 CARS REQUIRED (F.C) =21	CARS PROVIDED = 27

- **ENERGY AND WATER AVAILABILITY**

  In order to meet the power requirements of the project of 600 Kva, LESCO served as power source. The water requirements of the facility will be fulfilled by the Municipal supply lines, backed up by bore well, for all the construction and operational activities.

IV. PROJECT IMPACTS AND RECOMMENDATIONS FOR THEIR MITIGATION

The table given below shows the project impacts; related with construction and operation of proposed activities. Accordingly, mitigation measures have also been proposed to manage the environment and for sustainable development.

Table 1 Project Impacts and Mitigation Measures

Possible Impact	Impact Magnitude	Proposed Mitigation Measures
Construction Phase		
Dust emissions likely to occur during the excavation of the top soil and loading and transportation of the construction waste.	Minor/Short Term	Water sprinkling on all active construction areas and transportation routes on intermittent basis during the construction. Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard. Pave; apply water when necessary, on all unpaved access roads, parking areas and staging areas at construction sites. Provision of PPEs to workers

Possible Impact	Impact Magnitude	Proposed Mitigation Measures
Hydrology and water quality degradation.	Minor/Short Term	Construction of the cemented septic tank, having 24 hours retention capacity to control the water leaching. The proponent will prepare a hazardous substance control systems and emergency response plans that will include preparations for quick and safe cleanup of accidental spills to avoid any water contamination.
Oil spills from machines to be used on site and vehicles.	Minor/Short Term	The contractor will control the dangers of oil spills during construction by maintaining the machinery in specific areas designed for this purpose, hence, will not be a serious impact as a result of the construction. Preparation of Spill Management plan by the contractor.
Noise pollution due to the moving machines (mixers, tippers, communicating workers) and incoming vehicles	Minor/Short Term	Install portable barriers to shield compressors and other stationary equipment where necessary. Apply speed limit for pickup, trucks and other small equipments, observe a common-sense approach to vehicle use and encourage workers to shut off vehicle engines whenever possible. Avoid horn use.
Workers accidents and hazards during construction.	Minor/Long Term but reversible	Provision of appropriate and adequate Personal Protective Equipment (PPE) to employees. Enforcement and proper use of PPE by all construction workers.

Possible Impact	Impact Magnitude	Proposed Mitigation Measures
		Provision of appropriate tools, equipment, and machinery in sound working conditions to employees.
Operation Phase		
Solid waste production during the operational activities from building.	Major/ Long term	Solid wastes resulting from the building will be disposed of properly to avoid any threat to the environment through the local contracor providing the services for solid waste transportation and dispsoal. The contractors to whom any waste recyclable material is to be sold shall be fully made aware of the environmental impacts and health effects of the waste to be sold to him if there is any.
Noise will be generated from the standby generator.	Minor/ Long Term	Proper covering of standby generator, to reduce the noise. Noise reduction measures like buffering of noise through trees should be adopted where deemed necessary to reduce the noise level at the project boundary.
Air Emissions will be generated from standby generator	Minor/Long Term	In house HVAC equipments will help cleaning the air that can be source of air emissions.
Disruption of water quality due to mixing of oils, grease, and lubricants during operations and unhandled disposal of sewage water	Minor/ Short Term	Water quality monitoring should be carried out at the site. Parameters to be monitored at all locations should include the same as prescribed by the PEQS. Construction of septic tanks

Possible Impact	Impact Magnitude	Proposed Mitigation Measures
Disposal of sewage	Minor	The sewage shall be drain to the main line of Water and Sanitation Agency (WASA), for which the augmentation charges will be paid by the project proponent before operation.

V. PROPOSED MONITORING

The monitoring program is designed to ensure that the requirements of the environmental approval awarded by the EP&CCD are met. Monitoring Program (MP) provides important information that allows for more effective planning and an adaptive response based on the assessment of the effectiveness of mitigation measures. The monitoring of various parameters will help to determine the extent to which project construction/operation activities will cause an environmental disturbance.

Table 2 Environmental Monitoring Plan

Environmental segment/element	Monitoring parameters	Reference location/monitoring point	Monitoring frequency
Construction Phase			
Water Quality	As prescribed by the Punjab environmental Drinking Water Quality Standards	Main Drinking Water Source	Quarterly
Ambient air emissions	Dust, Smoke, PM, SO_x, NOx, CO	Use of generators, movement of materials, digging or excavation.	Quarterly
Waste water including Sewage	Ensure that all wastewater is treated to the level set by the PEQS.	The sewage or sanitary wastewater by the campsite and use for other construction activities.	Quarterly

Environmental segment/element	Monitoring parameters	Reference location/monitoring point	Monitoring frequency
Noise	The Levels prescribed as in Punjab environmental quality standards	The noise produced by the machinery during construction work.	Quarterly
Solid Waste Disposal	Ensure that all wastes are disposed of according to legal requirements of the country.	The waste material, rubble and solid waste produced by the camp site	Quarterly
Operational Phase			
Water Quality	As prescribed by the Punjab environmental Drinking Water Quality Standards	Main Drinking Water Source	Quarterly
Ambient air emissions	Methane and carbon dioxide, PM, CO, O_3	Generator Area	Quarterly
Waste water including Sewage	Ensure that all wastewater is treated to the level set by the PEQS-Pakistan.	Main Disposal Site	Quarterly
Noise	Noise levels	Generator and parking area	Once monthly at all involved places
Solid Waste Disposal	Ensure that all wastes are disposed of according to legal requirements of the country.	Building's solid waste/ storage area	Regularly in connection with environmental and safety rounds.

VI. STAKEHOLDER CONSULTATIONS

Public discussions were held with the inhabitant of the surrounding area. They are quite positive about the project and see the project as growing the business and accomplishing towards the positive development in the area at local and in the country as a whole. The people observe strong positive impacts regarding employment and structural development due to this project. EIA findings depict that people perceive overall positive social and economic impacts by the project. Their attitude towards the project establishment is highly optimistic. Majority of the people are convinced for development in the area and they correlate this progress with the pace of their social mobility.

VII. CONCLUSION AND RECOMMENDATION

The report provides a conclusion based on the impacts assessed and mitigation measures suggested. The report recommends that EMP will be made a part of all contract documents. The design of the scheme should meet the PEQS parameters in all aspects. The contractor will be bound to completely implement relevant mitigation measures set out in the EMP during construction phase while during regular operation of the project. The proponent will be responsible to ensure all the compliance of PEQS.

1 INTRODUCTION

The project is a high-rise multi-use development that includes a variety of facilities designed to cater to diverse needs. Over the last few years, the number of commercial buildings in Lahore has suddenly increased. This boom in high-rise commercial buildings highlights a major cultural shift among the younger residents of the bustling city. However, Lahore remained more or less indifferent to this growing culture – until recently. Much like the rest of the country, the population of Lahore has seen immense growth. From 6.3 million people in the 1998 census to its current official standing at 11.12 million according to the 2017 census, the number of people living in the city has almost doubled. This is largely due to the fact that people from other parts of the country have begun to move here for better education and job opportunities. However, the city's boundaries have not been pushed enough to accommodate its inhabitants.

The present project proposed is **Zameen ARX (Proposed Mixed-Use Building) By Zameen Residences (SMC-PVT) limited** which is endeavoring to come with the similar aims in their business establishment.

This mixed-use development maximizes the utility of the plot by integrating residential, commercial, and hotel rooms, making it a significant addition to the urban landscape. Its design promotes accessibility, caters to a broad range of users, and enhances its value. The inclusion of a service floor and shared amenities also reflects an emphasis on efficient operations and sustainable building practices.

The project is the Mixed-Use in nature which facilitates the people with most luxurious, and environment friendly accommodation. This project will give option to companies to carry out day-to-day operations and serve customers or clients. The proposed project for its commissioning requires to fulfill the legal requirements of the Punjab Environmental Protection Act (amended act 2012), Section 12, for which this Environmental Impact Assessment (EIA) is being submitted in Environment Protection & Climate Change Department (EP&CCD), Government of the Punjab, Lahore.

1.1 PURPOSE OF THE REPORT

In accordance with the Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations 2022, the project for Mixed-Use Building at Plot No 2B-30, Business Bay II, CBD Punjab, Lahore. The project falls in Schedule-II (H). Urban Development and Tourism Projects for which an Environmental Impact Assessment (EIA) report is required for Environmental Approval.

According to the Punjab Environmental Protection Act (PEPA), Section 12 - Initial Environmental Examination and environmental impact assessment: "No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Provincial Environmental Protection Agencies, as the case may be, or, where the project is likely to cause an adverse environmental effects an environmental impact assessment and has obtained from the Government Agency

approval in respect thereof." It is this legal requirement from the Government of Punjab that this Initial Environmental Examination report has been prepared to get Environmental Approval (EA) from the Environmental Protection Agency, Government of Punjab, Lahore.

This report provides detailed basic information and facts of project; including especially among others environmental, economic, social, etc., enabling its assessment and justification that the project will meet the requirements of environmentally sustainable practices; both during installation and regular operation stages; as desired under the Punjab Environmental Protection Act, 1997 (amended 2012), the Punjab Environment Quality Standards and rules and the regulations thereof. The other relevant regulations and guidelines considered while preparing this EIA report include:

- Policy and procedures for filing, review, and approval of environmental assessments.
- Guidelines for the preparation and review of environmental reports.
- Guidelines for public participation.
- Guidelines for sensitive and critical areas.
- Detailed sectoral guidelines.

Different environmental aspects like social, physical and biological etc and other related features of the project both during installation and its regular occupancy are highlighted in this EIA report. Measures necessary to be adopted to mitigate any environmental impacts on any part of the environment around are also described. All the important information is also provided as described under the format used to help decision-makers, EPA Punjab in the present case, before issuing the desired Environmental Approval (EA).

1.2 IDENTIFICATION OF PROJECT AND PROPONENT

The proposed project is the construction of Mixed-Use building over an area, 40,000 Sft. to Project having four basement, ground floor up to 33rd floors including one service floor at 16th floor, of above cited plot. Project having apartment building offices, commercial mall, hotel apartments, simple apartment, restaurant and offices. The details of the proponents are as followings;

Proponent: **Mr. Adil Ahmad Kamal**

Address: House No.264-A, Muhammad Ali Johar Town, Lahore, Pakistan

1.3 DETAILS OF CONSULTANTS

Integrated Environment Consultants

Office: 218 Upper Mall Scheme, Lahore.

Phone: +92 42 37897273

Email: *inenvconsultants@yahoo.com*

1.4 PERSONS PERFORMING THE EIA STUDY (TEAM MEMBERS)

The proponent has assigned the task of preparing EIA report to M/S Integrated Environment Consultants, Lahore. The EIA study of the proposed project has been conducted according to Environmental Assessment Procedures, 1997, Review of IEE and EIA Regulation 2022 as prescribed by the Federal Environmental Protection Agency (Pak EPA), Government of Pakistan. The study team of M/S Integrated Environment Consultants which completed the EIA report consists of following experts as mentioned in **Table -1.1.**

Table 1.1 Members Completed EIA Process

Name	Qualification	Status in Project
Mr. Ahtasham Raza	MPhil (Env. Sciences) GC University, Lahore	Project In-charge
Mr. Adnan Sharif	MPhil (Env. Sciences) University of Lahore Diploma in Environmental Law - Punjab University	Team Leader
Mr. Mehmood Amjad	BS (Hons) Environmental Sciences NFC.IET. Multan	Monitoring In-charge
Iris Earnest	PhD Environmental Sciences GC University, Lahore	Senior Environmentalist
Nimra Shehzadi	MPhil Environmental Science GC University, Lahore	Environmentalist
Mohsin Majeed	BS Environmental Sciences	Environmentalist
Muhammad Irshad	BS Environmental Sciences	Environmentalist

*Only the main roles of the team members are given. However, their role was not restricted to these, rather it also includes many other studies in their respective fields in the context of this EIA studies.

1.5 OBJECTIVE OF THE REPORT

Objectives to conduct this EIA are as following:

1. A legal binding in accordance to Punjab Environmental Protection Act-2012 (amended Act).

2. To identify the potential environmental issues pertaining to the proposed site.
3. To evaluate the ability of the site by keeping in view the social acceptance and environmental soundness.
4. Providing maximum information of the proponent and other stakeholders, regarding existing environmental conditions and the implications of the proposed project.
5. Collection of available data, reports, drawings and other relevant information about the proposed project.
6. Review of applicable existing environmental legislation and Punjab Environmental Quality Standards (PEQS).
7. Propose mitigation measures to eliminate or to reduce the negative impacts to an acceptable level.
8. Development of well-resourced environmental management and monitoring plans to identify mitigation strategies targeted towards avoidance, minimization, and rehabilitation of the impacts.

1.6 EXTENT OF THE STUDY

In compliance with PEPA-2012 (amended act) requirements, an EIA report has been prepared by M/S Integrated Environment Consultants, Lahore. This document covers all environmental impacts, due to the proposed project, in and around the project area comprising the physical, ecological and socio-economic aspects together with identification of the potential positive and negative impacts. Any developmental activities outside the project area and establishment of the other factories outside the project vicinity have not been covered under this study.

1.7 METHODOLOGY

The methodology adopted to carry out the EIA study of the proposed project was as follow:

- Orientation
- Planning of Data Collection
- Data Collection
- Site Reconnaissance Surveys
- Analysis of Maps and Plots
- Literature Review
- Public Consultations
- Field Studies/visits
- Laboratory Analysis

- Evaluation of Impacts and their analysis
- Categorization of impacts based on their potential environmental significance and prescription of preventive / mitigation measures.

In addition to the evaluation and review of the available records, data and the facts for the previous project, detailed discussions were held with the concerned members of the project management as well as other project stakeholders.

Notes and proposals for measures to be taken to mitigate and compensate for any determined/detrimental environmental impacts are contained in the Environmental Management Plan (EMP) as well as a Monitoring Plan, including all parameters that need to be measured, and the frequency of monitoring actions.

A comprehensive qualitative and quantitative methodology was adopted to conduct this study inter-alia in due compliance with the EIA requirements. The study included a collection of both primary and secondary data regarding environmental status and other relevant factors. This EIA report has been accomplished after carrying out thorough visit to the proposed site and detailed investigation to identify the following Environmental areas of concern:

- To achieve the desired environmental compliance standards; as per the national environmental regulatory requirements; as applicable to the project.
- Plans and activities to prevent/mitigate any potential impacts and the gaps that could probably remain after implementation.
- Any other points/steps to be taken which could be beneficial to mitigate environmental adverse impacts that may accrue both during construction and regular operation of the project.

Table 1.2 Environmental Assessment Process

Phase	Activities	Status	Responsibility
Screening and Scoping	Reconnaissance and initial site visit and consultations, identification of environmental and social issues & applicable safeguard environment policy, categorization and working out an action plan.	Carried out during the present EIA	Project Management (PM)

Phase	Activities	Status	Responsibility
Impact Assessment	Identification of potential environmental and social impacts through site visits, stakeholders' consultations, review of drawings, alternatives etc	during the present EIA	Project Management (PM)
Impact categorization	The significant potential impacts were tabulated and mitigation/preventive measures were prescribed	during the present EIA	Project Management (PM)
EMP Preparation	Stakeholders/Women consultation	Carried out during/prepared as part of the present EIA	Project Management (PM)
	EMP		
Final EMP	Final version of EMP produced	Included in EIA	Project Management (PM)

2 SCREENING OF PROJECT

According to the review of the Initial Environmental Examination (IEE)/Environmental Impact Assessment (EIA) Regulation 2022, as prescribed by the Environmental Protection Agency, Government of the Punjab, the project is Mixed-Use in nature. In accordance with the Environmental Protection Agency, Government of the Punjab, Lahore, "List of Projects Requiring an EIA", the project under consideration fall into the of Schedule-II (H- Urban Development and Tourism), that is the category of the projects requiring Environmental Impact Assessment (EIA). Therefore, to fulfill the legal requirements of the Section-12 of the Punjab Environment Protection Act (amended 2012); the client is required to submit the EIA report in the Environmental Protection and climate change department (EPCCD), Government of the Punjab, Lahore to obtain the required Environmental Approval (EA).

H- Urban Development and Tourism

1. Housing Schemes more than 300 Kanals.
2. Large Scale Tourism development projects
3. Hospitals having more than 50 beds
4. **Hotels more than 100 rooms**
5. Industrial Estates (including export processing Zone)

3 Scoping of the project

The scoping process outlines the essential concerns and impacts requiring detailed investigation. It establishes the spatial and temporal limits, crucial concerns raised during consultations, and significant impacting factors impacting the project.

3.1 Spatial and Temporal Boundaries of Environmental Assessment

Considering spatial and temporal boundaries in environmental assessments is vital to comprehensively evaluate the impact of a project. Spatial boundaries define the area affected, aiding in recognizing the extent of impact on ecosystems and nearby communities. Temporal boundaries assess short and long-term effects, enabling an understanding of how impacts evolve over time and helping in planning mitigation measures and long-term sustainability strategies. This approach ensures accurate, detailed assessments and effective addressing of potential environmental consequences related to the project. The proposed project is located at Plot No 2B-30, Business Bay II, CBD Punjab, Lahore.

3.2 Important issues and concerns raised during consultation

The EIA for the proposed project incorporated a two-stage consultation process, primarily focused on one-on-one meetings. In the initial stage, the consultation was specifically directed towards engaging local government authorities, affected individuals, and local communities. The primary goal of this stage was to evaluation both the short-term and long-term impacts that might result from the new development proposed for the project in its early stages. The intent was to gather insights and perspectives from key stakeholders in the immediate vicinity to better understand potential environmental, social, and economic implications of the project.

The second stage of consultations, as indicated, will be conducted through a more extensive process of public participation if deemed necessary. This broader involvement will allow for a wider outreach to the public, enabling a more comprehensive engagement to gather additional feedback, concerns, and insights from a larger cross-section of the community. This will ensure a more inclusive approach, providing an opportunity for a wider range of stakeholders to contribute their perspectives, concerns, and suggestions, which can be valuable in shaping and refining the EIA for the proposed project.

3.3 Significant impacts and factors to be determined

The determination of significant impacts involves assessing environmental risks, safety and health concerns for workers, community impact, infrastructure and property damage, emergency response planning, regulatory compliance, and the adequacy of preventive measures. Understanding and addressing these factors are essential to ensure safe operations, mitigate risks, and protect the environment, workers, communities, and infrastructure from potential hazards.

3.4 Development of an Environmental Management Plan

The EMP in an EIA is crucial as it outlines strategies to mitigate environmental impacts, ensures regulatory compliance, guides project operations, promotes sustainability, reduces risks, assures stakeholders, and allows for ongoing improvement and adaptation to address environmental concerns throughout the project's lifecycle.

These key parts of EMP include a clear description of the project, an outline of potential environmental impacts and risks, specific mitigation measures tailored to address these impacts, a comprehensive monitoring and reporting system to track environmental indicators, protocols for emergency response and contingency planning, details on stakeholder

engagement and communication strategies, and a framework for ongoing review and updates to ensure the plan's adaptability and effectiveness over the course of the project. Together, these components form a comprehensive EMP designed to guide environmental practices, minimize adverse impacts, and maintain compliance with regulations and best practices in environmental management.

4 ALTERNATIVES OF THE PROJECT

The alternatives for the proposed project were analyzed to determine the most feasible and environmentally sustainable option. Below is a detailed evaluation of the considered alternatives.

Project Alternatives

- No project option
- Site Alternative
- Technology Alternative

4.1 No Project Option

❖ **Strengths and Opportunities**

If the project is not taken up at all then all the funds, efforts and inconvenience will be saved and these will become available for diversion to other projects of the proponent. No more land will be required and no disturbance will be caused to people through project construction process. Further, the recurring cost of the maintenance of the project along with enhanced operational costs will be saved. No disturbance will be caused to any physical, biological and social part of the environment. The people benefiting out of a status quo will continue benefiting.

❖ **Weaknesses and Threats**

The absence of modern facilities, could lead to several negative implications. Limited energy options may result in a greater dependency on less efficient and traditional energy sources, increasing operational costs and environmental degradation. This reliance on outdated systems could pose significant health hazards, including indoor pollution and elevated carbon emissions. Furthermore, basic needs such as heating and food preparation could become more challenging, affecting the quality of life for residents. The lack of infrastructure would also restrict economic growth, hindering businesses that depend on reliable and modern facilities. Lastly, the reliance on unregulated and potentially unsafe energy sources could create serious safety risks for the community.

Conclusion

The "No Project Option" results in significant drawbacks, including negative impacts on affordability, convenience, health, and economic development. Therefore, this option is not recommended.

4.2 LOCATION ALTERNATIVES

4.2.1 Construction on Government Land

The option of constructing the project on government land presents both advantages and challenges. On the positive side, the identified government land is technically suitable for the project and ensures compliance with safety and environmental regulations. However, this option also has significant drawbacks. The additional bureaucratic processes required to obtain approvals and permits could lead to delays in project implementation. Moreover, the associated leasing or usage fees for government land may increase costs, potentially impacting the financial viability of the project. Furthermore, government-imposed restrictions on development or expansion could limit the flexibility of the project's design and long-term operational plans, making this option less favorable overall.

4.2.2 Construction on Proponent's Land

Constructing the project on proponent-owned land offers numerous advantages, making it the preferred option. This land ensures logistical convenience and adheres to environmental and safety standards, eliminating the need for time-consuming land acquisition processes and regulatory approvals. Additionally, it avoids extra costs such as lease or rent payments, enhancing the project's financial viability. Ownership of the land provides the proponent with greater control and flexibility in development and operations, aligning seamlessly with strategic objectives. Furthermore, this option streamlines the construction process, reducing potential delays and ensuring efficient execution. Overall, the benefits of using proponent-owned land strongly outweigh other alternatives.

5 DESCRIPTION OF THE PROJECT

5.1 GENERAL

This section deals with project components, which are the part of the utility and its related activities. It also describes the category of the project, availability of construction materials, construction time and cost of the project, construction and operational equipment etc. The information presented in this section is based on project site survey, preliminary design report, and other related details provided by the provided by the client.

5.2 TYPE AND CATEGORY OF THE PROJECT

The project is apartment in nature. In accordance with the IEE/EIA Regulation 2022 of Environmental Protection Agency, Government of the Punjab, Lahore, "List of Projects Requiring an EIA", the project under consideration fall into the Schedule-**II (Urban Development and Tourism)** that is the category of the projects requiring Environmental Impact Assessment (EIA). Therefore, to fulfill the legal requirements of the Section-12 of the Punjab Environment Protection Act (amended 2012), the client is required to submit the EIA report in the Environmental Protection Agency, Government of the Punjab, Lahore to obtain the required Environmental Approval (EA).

5.3 OBJECTIVES OF PROJECT

The project is the apartment in nature which facilitates the people with most luxurious, and environment friendly accommodation Building is a unique project having four basement, ground floor up to 33rd floors including one service floor at 16th floor, of above cited plot. Project having parking area, offices, commercial mall, hotel apartments, simple apartment, restaurant and office. This project will give option to companies to carry out day-to-day operations and serve customers or clients.

The project is the apartment in nature which facilitates the people with most luxurious, and environment friendly accommodation.

5.4 ALTERNATIVES CONSIDERED, AND REASONS FOR THEIR REJECTION

The construction of Mixed-Use Building is a commercial speculation in the area. To fulfill the commercial aspects of the project under the reference of this EIA Report, it is to be sited at a place having commercial processing activity is either already going on or there are bright prospects of the same. Concurrently, it must also meet the legal requirements of the Pakistan Environmental Protection Act, 1997 (amended 2012). Availability of land at the best convenient place is equally important among other considerations for the site selection. Availability of access roads, communication facilities, electricity, basic infrastructure, sewerage etc is yet the other necessary requirements. Obviously, environmentally sound, neat and clean environment are the other considerations for site selection. The project will also facilitate the people of the area with increasing the opportunity of employment and others related facilities.

Keeping these requirements and their feasibility and other basic infrastructural requirements are also available at the selected site. Accordingly, the selected site is

preferable for construction of a building.

5.5 LOCATION OF THE PROJECT:

The project is located at Plot No 2B-30, Business Bay II, CBD Punjab, Lahore. The Google coordinates of the project latitude 31.493253°"N and longitude 74.347476°"E

Figure 5.1 Location of the Project

5.6 HEIGHT AND AREA STATEMENT:

The height of the building is 419 Feet. The total area covered and open are stated below in the table:

Table 5.1 Area Statement

PARKING					
FLOOR	**PLATE AREA**	**F.A. R**	**USEABE**	**CARS PROVIDED**	**CARS PROVIDED (STACK)**
BASEMENT 4	31,926	-	-	56X2=112	112
BASEMENT 3	31,926	-	-	54X2=108	108
BASEMENT 2	31,926	-	-	54X2=108	108
BASEMENT 1	31,926	-	-	54X2=108	108
TOTAL	127,704	CARS REQUIRED=435		CARS PROVIDED=436	436
BIKE CALCULATION		(436X1280) X 0.16=8929/15 95 BIKES		BIKES REQUIRED 595	BIKES PROVIDED 628
COMMERCIAL MALL					
FLOOR	**PLATE AREA**	**F.A. R**	**USEABE**	**NONUSEABLE**	**CARPET AREA**
GROUND FLOOR	23,296	16,859	17,908	5,388	3,437
1ST FLOOR	22,868	19,35	19,392	3,476	12,090
2ND FLOOR	23,295	19,562	19,819	3,476	9,587
TOTAL	69,459	56,356	57,119	12,340	27,114
PARKIN CALCULAION		1 CAR PER 800(CARPET AREA) (MALL)=17527 SFT 1 CAR PER 500(CARPET AREA) (F.C) =9587 SFT		CARS REQUIRED=41	CARS PROVIDED=41
OFFICES					
FLOOR	**PLATE AREA**	**F.A. R**	**USEABE**	**NONUSEABLE**	**CARPET AREA**
3RD FLOOR	23,344	20,293	20,379	2,965	14,420
4TH FLOOR	23,344	20,293	20,379	2,965	14,420

5TH FLOOR	23,344	20,293	20,379	2,965	14,420
6TH FLOOR	23,344	20,293	20,379	2,965	14,420
7TH FLOOR	23,344	20,293	20,379	2,965	14,420
8TH FLOOR	23,344	20,293	20,379	2,965	14,420
9TH FLOOR	23,344	20,293	20,379	2,965	14,420
10TH FLOOR	23,344	20,293	20,379	2,965	14,420
TOTAL	186,752	162,344	163,032	23.720	115,360
PARKIG CALCULATION		1 CAR PER 1000 (CARPET AREA) =115,360 SFT		CARS REQUIRED=115	CARS PROVIDED=115
HOTEL APARTMENTS					
FLOOR	**PLATE AREA**	**F.A. R**	**USEABE**	**NONUSEABLE**	**-**
11TH FLOOR	22,247	19,873	20,063	2,184	-
12TH FLOOR	22,073	19,699	19,889	2,184	-
13TH FLOOR	22,073	19,699	19,889	2,184	-
14TH FLOOR	22,073	19,699	19,889	2,184	-
15TH FLOOR	22,073	19,699	19,889	2,184	-
TOTAL	110,539	98,669	99,619	10,920	-
PARKIG CALCULATION		1 CAR PER 6 ROOM (HOTEL APARTMENTS) =104/6=17 CARS +35 CARS AMENTIED		CARS REQUIRED=52	
APARTMENTS					
FLOOR	**PLATE AREA**	**F.A. R**	**USEABE**	**NONUSEABLE**	**CARPET AREA**
17TH FLOOR	22,073	19,699	19,889	2,184	14,013
18TH FLOOR	22,073	19,699	19,889	2,184	14,013
19TH FLOOR	22,073	19,699	19,889	2,184	14,013

20TH FLOOR	22,073	19,699	19,889	2,184	14,013
21TH FLOOR	22,073	19,699	19,889	2,184	14,013
22TH FLOOR	22,073	19,699	19,889	2,184	14,013
23TH FLOOR	22,073	19,699	19,889	2,184	14,013
24TH FLOOR	22,073	19,699	19,889	2,184	14,013
25TH FLOOR	22,073	19,699	19,889	2,184	14,013
26TH FLOOR	22,073	19,699	19,889	2,184	14,013
27TH FLOOR	22,073	19,699	19,889	2,184	14,013
28TH FLOOR	22,135	19,761	19,951	2,184	13,860
29TH FLOOR	17,967	15,593	15,783	2,184	9,576
30TH FLOOR	22,135	19,761	19,951	2,184	13,860
31TH FLOOR	17,967	15,593	15,783	2,184	9,576
TOTAL	323,007	287,397	290,247	32,760	201,015
PARKIG CALCULATION		1 car per 1000 (CARPET AREA) (APARTMENT) =201,015 SFT		CARS REQUIRED=201	CARS PROVIDED=201
RESTAURANT AND OFFICE					
FLOOR	**PLATE AREA**	**F.A. R**	**USEABE**	**NONUSEABLE**	**CARPET AREA**
32ND FLOOR	22,073	19,699	19,888	2,185	16,288
33RD FLOOR	22,073	19,699	19,888	2,185	-
PARKIG CALCULATION		1 car per 1000 (CARPET AREA) (OFFICE) =5,930 SFT 1 car per 1000 (CARPET AREA) (F.C) =10358 SFT		CARS REQUIRED (OFFICE) =6 CARS REQUIRED (F.C) =21	CARS PROVIDED = 27

5.7 LAND USE:

The land occupied for the construction of the Residential Building is owned by the proponent and the land is open plot. The area in its surrounding is rapidly being commercialized.

5.8 ROAD ACCESS:

The project site is accessible located on **Main Boulevard road & Askari-5 road**. All the access roads are paved and are in good conditions.

5.9 CONSTRUCTION PERIOD AND COST

The project cost estimate has been prepared in 2024. The quantities have been worked out from the design drawings. The rates for cost estimates are based on construction work, contractor cost, cost of land, and cost of the raw materials with 10% escalation for the year 2024. The project cost as initially estimated will be Rs 1400 Million Rupees.

It is planned that the following schedule of project implementation will be adhered to. This is subject to the conditions that everything goes according to planning and no serious bottlenecks are encountered. The implementation stages of the project activity include:

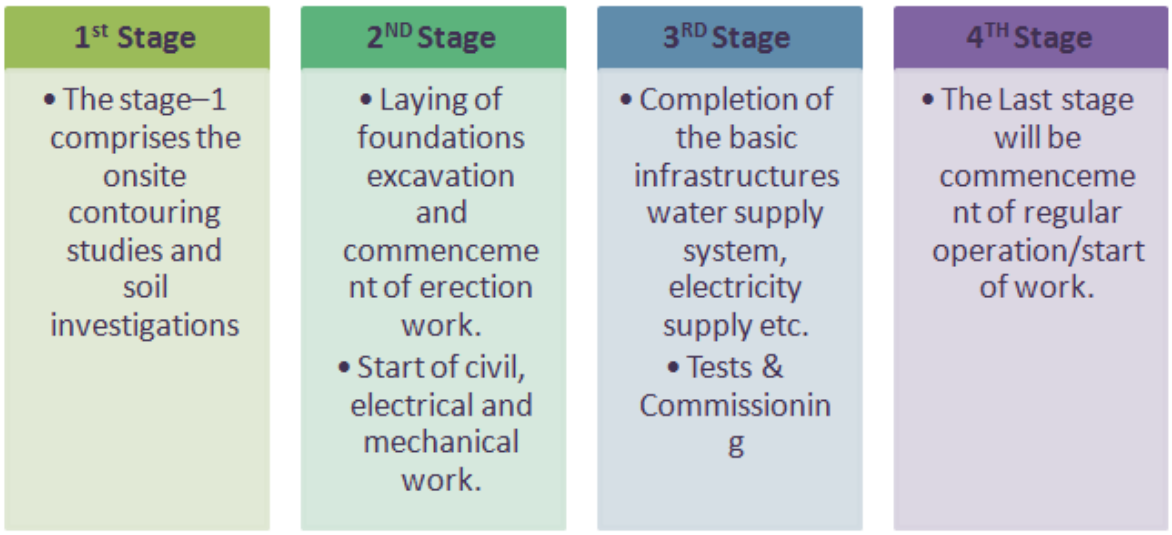

Figure 5.2 Schedule of Implementation

5.10 COST AND MAGNITUDE OF OPERATION

The total cost that has to be spending on the project is approximately 1400 Million rupees. The total area of the proposed plot is 40,000 Sft. Project having four basement, ground floor up to 33rd floors including one service floor at 16th floor, of above cited plot. Project having commercial building offices, commercial mall, hotel apartments, simple apartment, restaurant and office. The quantities have been worked out from the design drawings and project feasibility

5.11 ENERGY USE:

In order to meet the power requirements of 600 Kva, power source is connected to the LESCO. The proponent designed the proposed plan considering the renewable energy source to meet the demands of project, by installing the roof solar panels.

5.12 WATER USE:

The water requirements of the facility will be fulfilled by Ground Water (Bore Holes) and Municipal supply, for all the construction and operational activities.

5.13 OPERATIONAL ARRANGEMENTS

At operation stage, the project proponent will be involved in operation and maintenance of the proposed facility.

5.14 GENERAL DESCRIPTION OF PROJECT:

Mixed-Use Building in Plot No 2B-30, Business Bay II, CBD Punjab, Lahore-approved residential society in Lahore. CBD is fully developed and have subdivisions called "blocks," comprising both apartment and residential properties. The area boasts modern infrastructure and world-class facilities, ensuring a quality lifestyle among its residents. The project is an apartment-based, mixed-use development that provides luxurious and environmentally friendly accommodations while catering to diverse needs. It is a unique high-rise building featuring four basement levels, a ground floor, and 33 floors, including a service floor on the 16th level. The basements are primarily designed for parking, storage, and other essential services, ensuring convenience for residents and visitors. The ground floor serves as the main entry point, housing lobbies, reception areas, and access to various sections of the building.

This development includes multiple facilities such as parking areas, offices, a commercial mall, hotel apartments, simple apartments, a restaurant, and additional office spaces. The inclusion of hotel apartments provides the perfect blend of luxury and comfort, catering to travelers and long-term guests. These apartments offer hotel-like services such as concierge assistance, housekeeping, and room service, making them ideal for those seeking high-quality accommodations. The building's simple apartments are designed for individuals or families looking for a modern, minimalist lifestyle in a central urban location. Additionally, the restaurant enhances the overall appeal by offering dining options for residents, guests, and visitors.

The project is not only residential in nature but also provides spaces for businesses, giving companies an opportunity to carry out day-to-day operations and serve their customers or clients. The inclusion of a commercial mall adds a recreational and

shopping aspect to the building, making it a vibrant hub for both residents and the general public. The service floor strategically supports the building's operations by housing essential utilities such as HVAC systems, electrical panels, and water storage, ensuring the efficient and sustainable management of resources.

Overall, this project stands out for its unique blend of functionality, luxury, and sustainability. It maximizes the potential of the plot by integrating residential, commercial, and hospitality elements, making it a significant addition to the urban landscape while promoting an eco-friendly lifestyle.

5.15 RESTORATION/REHABILITATION AT THE END OF PROJECT LIFE

There will be no any matter of rehabilitation as the proposed site is already owned by the project proponent. There will not be any let regarding safety factors as applicable from time to time for such buildings on all accounts. However, at the end of the life of the building, it will be duly dismantled with special precautions to avoid/minimize pollution and at the same time taking all safety precautions to protect human life and property around the project site. Debris or any other wastes resulting from demolishing will be disposed of in environmentally sustainable fashion. The materials capable of recycling/reuse will be either sold in the market or to be reused for other suitable purposes.

After completion; all construction matrix, debris, and garbage will be removed off immediately from the site within the minimum possible time under safe conditions. Any minor spillover of these materials will be cleared adequately. The land, if and where pitted will be adequately leveled. On the whole, the project site and the area in its near vicinity will be made neat and clean.

6 DESCRIPTION OF THE ENVIRONMENT

6.1 Introduction

This chapter describes the baseline conditions, which cover the existing physical, ecological, and socio-economic environment of the Study Area. Information on these aspects has been derived from the desk study of available data, field visits to the project area as well as information obtained through visits to the Government departments and other agencies namely Irrigation Department, Meteorological Department, Forest offices and prevailing environmental laws and environmental quality standards etc.

6.2 Desk Studies

Project design data was collected from proponents. This data included the available documents, drawings, reports, etc related to the proposed project. The experts conducted a detailed desk study of the above available data before the field visit. Salient features of the Project were thoroughly reviewed to assess their environmental implications. The documents which were consulted and departments visited are Project Head Office, Project Site, Irrigation Department, Meteorological Department, Forest offices and other related officials.

6.3 Site Visits

A team of experts from visited to the proposed site for collection of baseline environmental data for ambient air, noise levels, drinking water and waste water sampling, public consultation, baseline ecological environment data etc.

After the survey of the project area the environmental data regarding physical, ecological and socioeconomic aspects were collected for carrying out environmental assessment. Secondary data were also collected from various sources mainly studies carried out by project proponents and reports of other line Departments. A social survey of the proposed area was carried in which people living around the proposed unit site were interviewed to ascertain their views about the project commissioning and operational activities to perceive the impacts on the natural and socioeconomic environment around the proposed project site. This included information on land, surface water, groundwater, air, vegetation, animals and human.

6.4 Spatial and Temporal Boundaries Adopted for the Various Aspects of the Study

The existing status of the environmental settings around the project site along with future likely trends of development and any change to occur in the land use pattern, especially industrialization trends and associated environmental and socio-economic concerns were the major considerations/spatial and temporal boundaries while taking stock of the existing and expected conditions.

6.5 PHYSICAL ENVIRONMENT

6.5.1 Topography

The topography of the project area is flat. The General height of the area is approximately 220 meters above the Mean Sea Level (MSL). The district Lahore is

divided into two parts. The low-lying alluvial soil is along the Ravi River and the upland in the east. Upland is a plain slope from north-east to south-west. The lowlands are generally inundated during the monsoon season by Ravi River, flowing in the west of district along its boundary with district Sheikhupura. Figure 3.1 represents the topography of the area

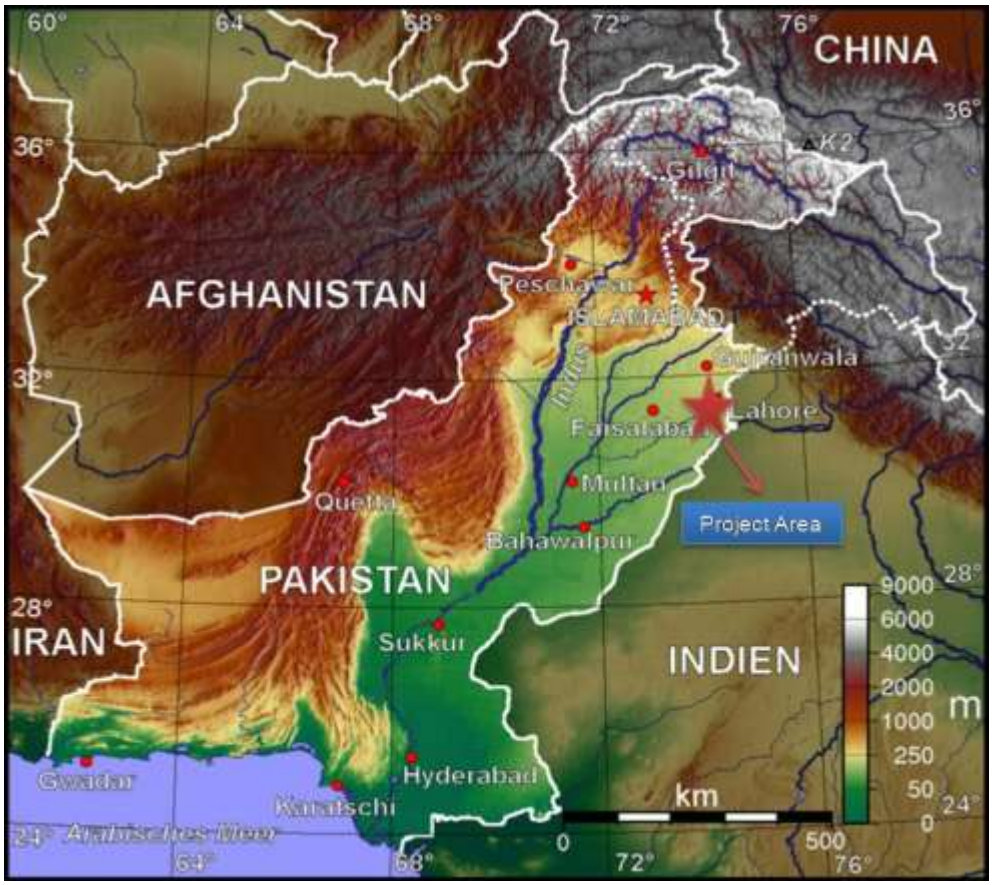

Figure 6.1 Topographic Map of the Pakistan

6.6 SOILS

The soil is different in character and generally inclined to be dry. However, it is rich in potential plant nutrients. Rainfall is low and groundwater is saline and brackish at the shallow depth and irrigation is largely dependent on the canals. Tube wells have also been sunk to the greater depths in the Project Area where fresh water is available.

The chemical quality of groundwater in the district varies with depth. However, the sweet potable water is available in a belt five to twenty miles wide paralleling the Ravi River.

Alluvium is soil or sediments deposited by a river or other running water. Alluvium is typically made up of a variety of materials, including fine particles of silt and clay and larger particles of sand and gravel. A river is continually picking up and dropping solid particles of rock and soil from its bed throughout its length. Where the river flow is fast, more particles are picked up than dropped. Where the river flow is slow, more particles are dropped than picked up. Areas, where more particles are dropped, are called alluvial

or floodplains and the dropped particles are called alluvium

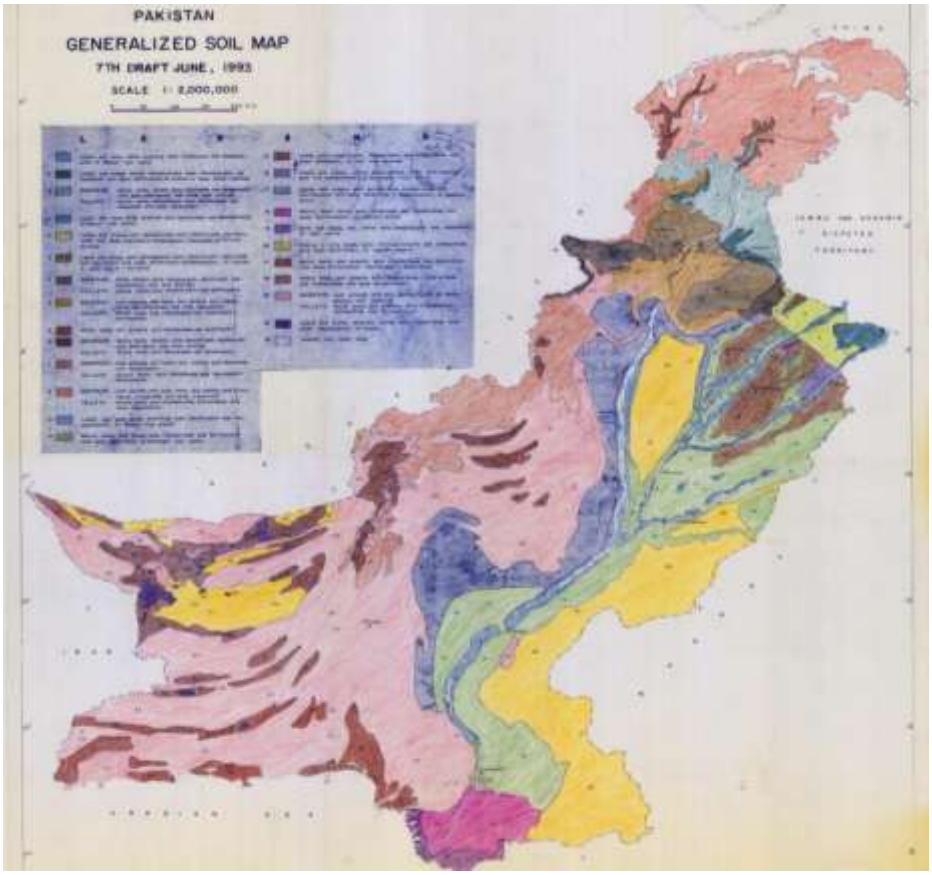

Figure 6.2 Soil Map of Punjab

6.7 Geology

Geological history of Lahore along with that of the Punjab is linked with the uplift of Himalayas in the Tertiary times, where a subsiding through a fore deep was formed adjoining the mountains. The alluvium mostly derived from the Himalayan ranges has been deposited in the Punjab geosynclines by the present and the ancestral tributaries of the Indus river system. The exposed Lahore alluvial complex of Pleistocene and recent age represents the latest phase of sedimentation and subsidence. Nearly all the deposits underlying the city of Lahore and the surrounding area are the products of events that evolved during Pleistocene and recent geological times. The study of logs of boreholes and tubewells conducted in and around Lahore show that the alluvium consists principally of fine to medium sand, silt and clay. Associated with the fine-grained strata are concretionary zones of nodules of Kankar and silty clay, occasionally containing beds of reddish and ferruginous material. Drilling data obtained from several deep wells shows the absence of thick horizons of clay within the alluvium. Clay lenses occur only locally and have little horizontal continuity. In 1961 bed rock (mica schist) was struck at 1,274 feet depth near Niaz Beg (Table 1) after which the drilling was abandoned by Water and Power Development Authority (WAPDA). In subsequent years drilling operations in and around Lahore did not exceed 800 feet depth. At present our knowledge of the deep geological formations underlying beneath the city of Lahore

is incomplete.

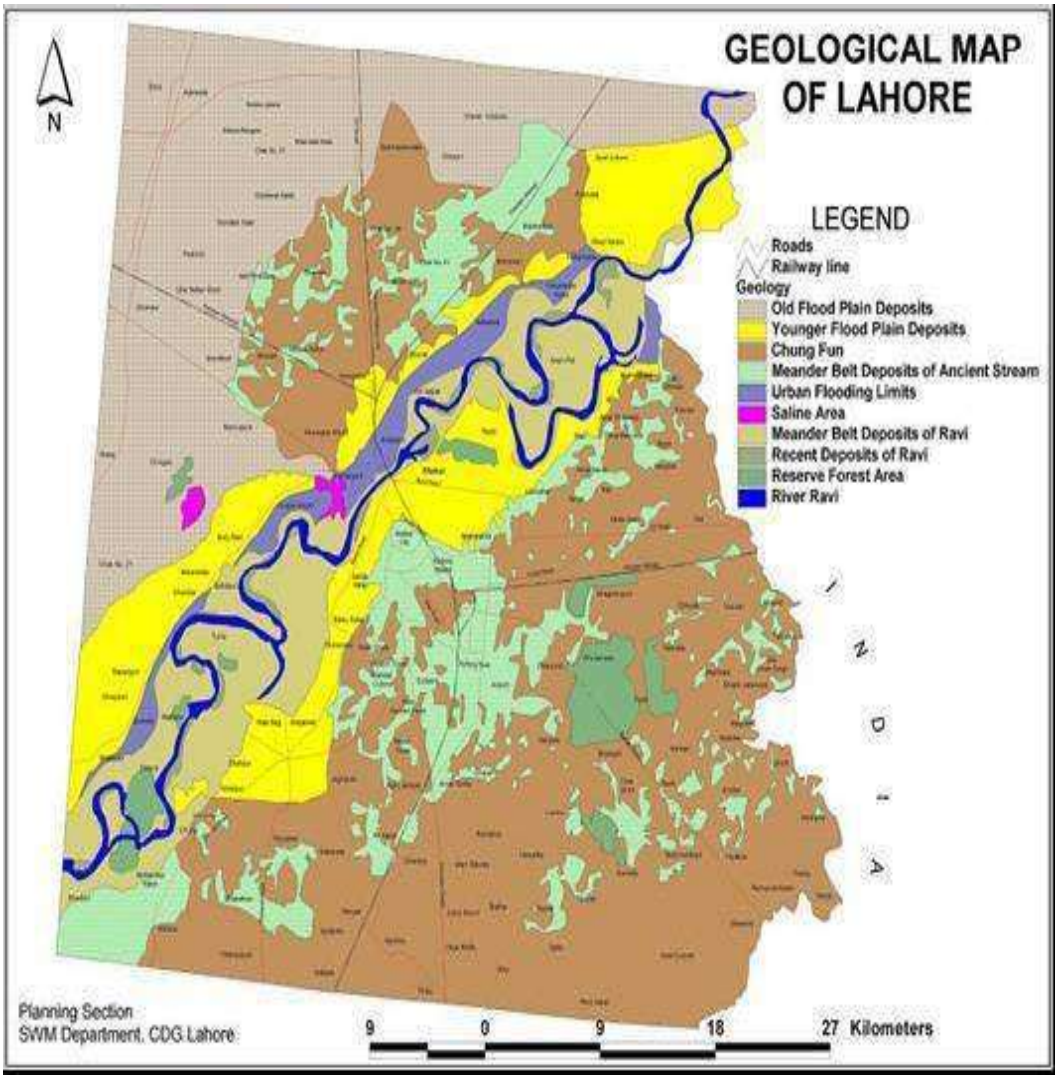

Figure 6.3 Geographical Map of Lahore

6.8 Hydrology

Lahore division is a part of Punjab Province of Pakistan. Geologically, this area is a part of lower Indus Basin. The name "Punjab" itself is an indicative of healthy presence and importance of rivers in this area. This word "**Punjab**" comes from 'punj-aab' meaning five rivers. The five rivers of Punjab were Sutlej, Bias, Ravi, Jehlum and Chenab Rivers. It is to be noted here that Bias River have discontinued to flow in Pakistan, as discussed later. This blessing has resulted in cultivation on mast part of land in Punjab as well as in the study area.

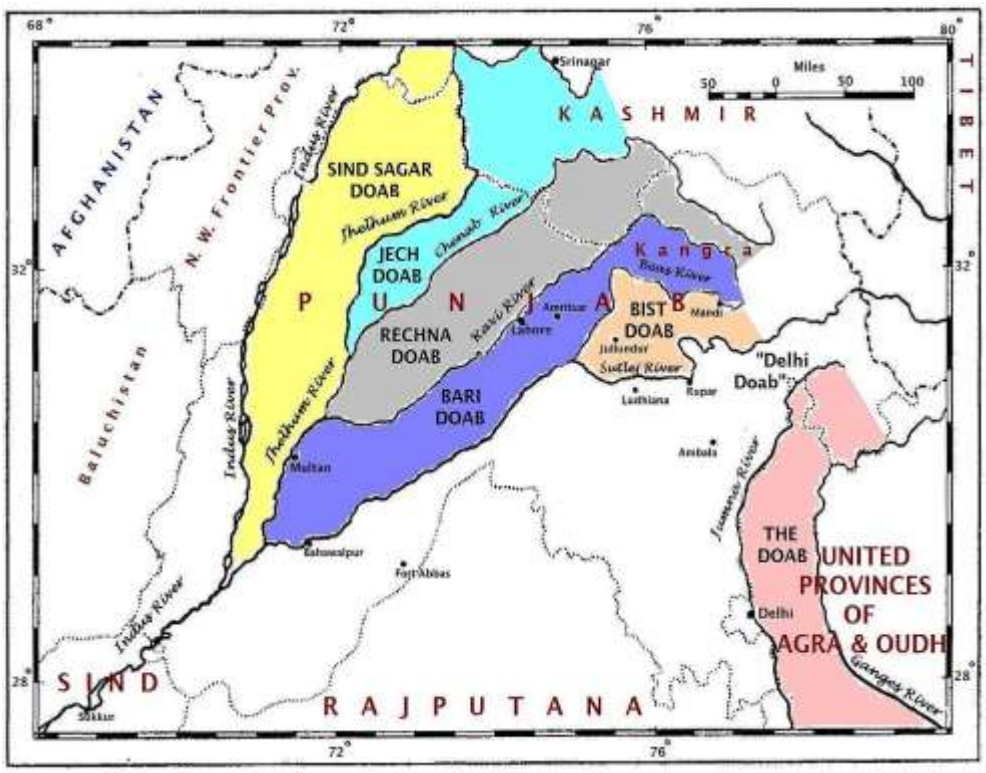

Figure 6.4 Watershed of Punjab

The only river passes from Lahore is Ravi River. The slope of the land in planned area is to the south-west, which directs the rivers to flow in this path. Average slope of the area is 0.32m/km.

The Ravi has a major contribution in glorious history of the study area. All the "historical assets" of Lahore, including but not limited to Lahore Fort, Badshahi Mosque and Kamran ki Baradari, were built adjacent to Ravi River.

As per the Indus basin treaty of 1960, six major rivers were divided among Pakistan and India. As per the treaty, the rights of Eastern Rivers (Sutlej, Bias and Ravi) were allocated to India, while the rights of Western Rivers (Chenab, Jehlum and Indus) were reserved with Pakistan. Since the Indus basin treaty, India has completed series of structures to store and divert water from upstream and use it for generation of electricity and irrigation. These interventions have put a stop to ecological and sustainable flows in these rivers, thereby depriving the downstream areas of Pakistan, including Lahore from naturally available water for irrigation. The Ravi allocated to India, still flows seasonally through the study area while Bias River have discontinued to flow.

Furthermore, the planned area has abundance of water in the form of groundwater aquifer. The aquifer of Lahore District is broadly viewed as a single contiguous, unconfined aquifer. The presence of alluvial soil, frequent flooding and excessive rains in this region for hundreds of years have enriched this aquifer with abundance of water.

Groundwater for drinking purposes is extracted from a depth of 120-200 meters (m). It is pumped for irrigation, domestic, industrial and commercial purposes.

6.9 SURFACE WATER & GROUND WATER

6.9.1 Surface Water

No rivers exist in the vicinity; however, storm water drains cross the route for disposal into the Ravi River. Water from River Ravi, flowing on the northwestern side of the city of Lahore, is being used for other purposes other than drinking purposes. River Ravi receives almost all the municipal/ industrial wastes from the city of Lahore. The potential value as a recreational water body and breeding place for fish is threatened by the municipal and industrial pollution.

6.9.2 Groundwater

Groundwater quality is fresh (defined as acceptable in terms of its salinity). Raw water abstracted from the deep tube wells is believed to be essentially bacteria free. The status of quality of groundwater both in the country and Punjab Province is shown in fig. The water quality in the upper 50 meters zone of the subsoil is generally brackish. For city's drinking purposes water is abstracted from groundwater aquifer by means of tube wells located throughout the city. The quality of water is generally adequate for direct consumption. About 83% of the city population is consuming groundwater for drinking purposes. Groundwater is available at a depth ranging between 15 to 23m below the natural surface level.

Water consumption varies significantly and its variation as of industrial units. Usual water consumption pattern for industrial units and data collected from the prospective industrialist will form the basis for total water demand.

According to Master Plan-2030 for the city of Lahore, the mean average decline in groundwater is about 2.03 feet per year. The water table contour map for the Year-2000 is exhibited in Exhibit-4.14. It is noted from the exhibit that groundwater is at a greater depth in the central part of the city where abstraction is more than the re-charge and close to surface waters i.e. Ravi River and Canal, the situation is in the reverse order.

6.10 CLIMATE AND METEOROLOGY

Seasonal climatic conditions must be considered for the design and execution of Project. The climate including air, temperature, precipitation, humidity, and evaporation is an influencing factor, affecting the construction of the plant and other engineering structures. However, to determine the overall effect of the climatic stresses, daily and seasonal temperature changes, site altitude, direct solar radiation, and precipitation must be considered. The Project Area has extreme climate: it has hot summer and cold winters. The summer starts from April and lasts till September. May, June, and July are the hottest months. The mean maximum and minimum temperature ranges from 40.4 ºC and 27.3 ºC respectively for these months.

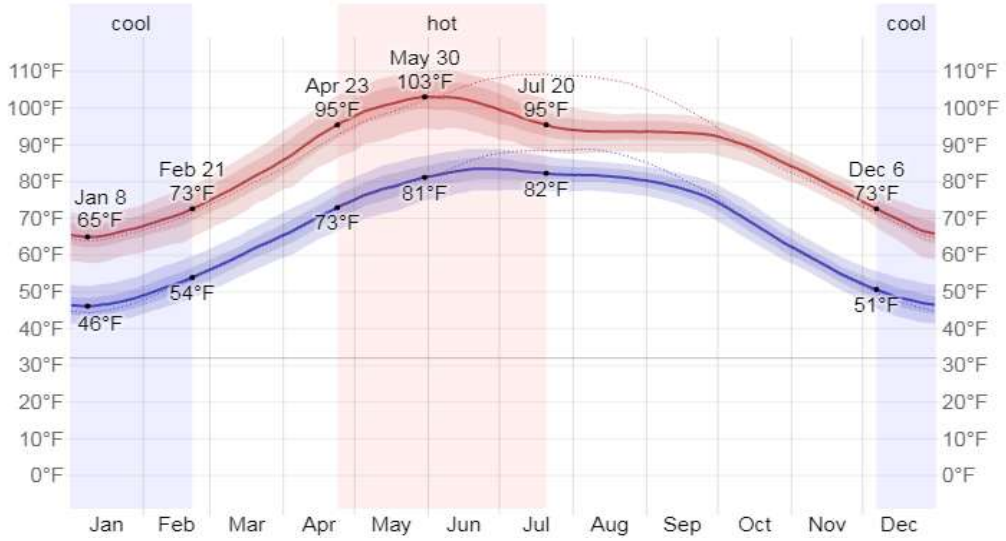

Figure 6.5 Temperature profile of Lahore

The winter seasons lasts from November to March. December, January, and February are the coldest months. The mean maximum and mean minimum temperature ranges from 19.8ºC to 5.9ºC in January. Temperatures in the Project Area vary from 5.9 ºC to 40.4 ºC.

Table 6.1: Meteorological and Climatic Features

Classification of Climate	Tropical (hot/humid)
Predominant Wind Direction	East/Northeast
Wind intensity	Weak to moderate
Average annual precipitation	>650 mm
Rainy season	July to September
Dry season	October to June
Average annual temperature	19-20 °C
Average summer temperature	36-38 °C
Average winter temperature	6.5-10.5 °C

Table 6.2: Average Monthly Temperature, Precipitation and Relative Humidity (2022)

Month	Mean Temperature		Precipitation (mm)	Average Relative Humidity (%)
	Maximum	Minimum		
January	18	8	100	72
February	24	11	31	60
March	28	15	39	54
April	37	22	62	40
May	39	26	50	37
June	37	26	176	54
July	36	27	200	68
August	35	27	184	69
September	35	25	50	63
October	34	22	0	56
November	24	13	19	72
December	22	9	31	63
Annual	30.8	17.8	666	78.34

Table 6.3: Rainfall Data of the Area

Month	Precipitation (Millimeters)
January	23
February	28.6
March	41.2
April	19.7

May	22.4
June	36.3
July	202.1
August	163.9
September	61.1
October	12.4
November	4.2
December	13.9
Annual	628.7

6.10.1 Pre-Monsoon Season

Pre-monsoon refers to the period from April to June prior to the setting in of the monsoon. This is the hottest and the driest season, with persistent dry and hot winds. Daytime temperature rises to 40° C. The flows in the river begin to rise simultaneously due to snow-melt water in the high mountains. The water table falls to the maximum depth

6.10.2 Monsoon Season

Monsoon is the main rainy period, which starts at the beginning of July, reaches its climax in August and gradually, subsides in September. High-intensity Rainfall causes soil erosion which is a function of erosivity and erodibility. The cool monsoon winds followed by heavy showers lower the temperature to great extent. The part of rain percolates into the soil and is conserved in the subsoil and part adds to the groundwater. The conserved moisture in the soils is generally sufficient to rejuvenate the vegetation. All plants grow rapidly and mature towards the end of the season. With the start of monsoon season, the rivers flow at their peak level. The groundwater level is improved toward the end of the season in September and October.

6.10.3 Post-Monsoon Season

Post monsoon season refers to autumn (October-November). The temperature starts falling but the extreme aridity prevents plants to flower early and sets seed toward mid-seasons. Groundwater level rises as a result of infiltration from rainfall.

6.10.4 Winter Season

Winter refers to the period from December to January. The lowest temperatures (< 20C) and cold winds characterize this season. The plants become dormant and most of them dry out. Most of the trees shed their leaves and few remain green or partly green.

Sometimes this season becomes severe due to cold Siberian winds. Groundwater level declines in this season due to low flows in the rivers and no or little rains which usually fall in light showers causing little soil erosion.

6.10.5 Spring Season

Spring refers to the period from February to March. Temperatures become pleasant. The mean maximum temperature is 27oC with the highest precipitation of 41.2 mm and relative humidity of 57.6 percent. Some light showers of rain may also fall without generating runoff. The vegetation sprouts again because of conserved moisture from winter and spring rains, if any. The water table starts falling

6.10.6 Solar Elevation

Solar elevation over the year 2022, shown in the figure. The black lines are lines of constant solar elevation (the angle of the sun above the horizon, in degrees). The background color fills indicate the azimuth (the compass bearing) of the sun. The lightly tinted areas at the boundaries of the cardinal compass points indicate the implied intermediate directions (northeast, southeast, southwest, and northwest).

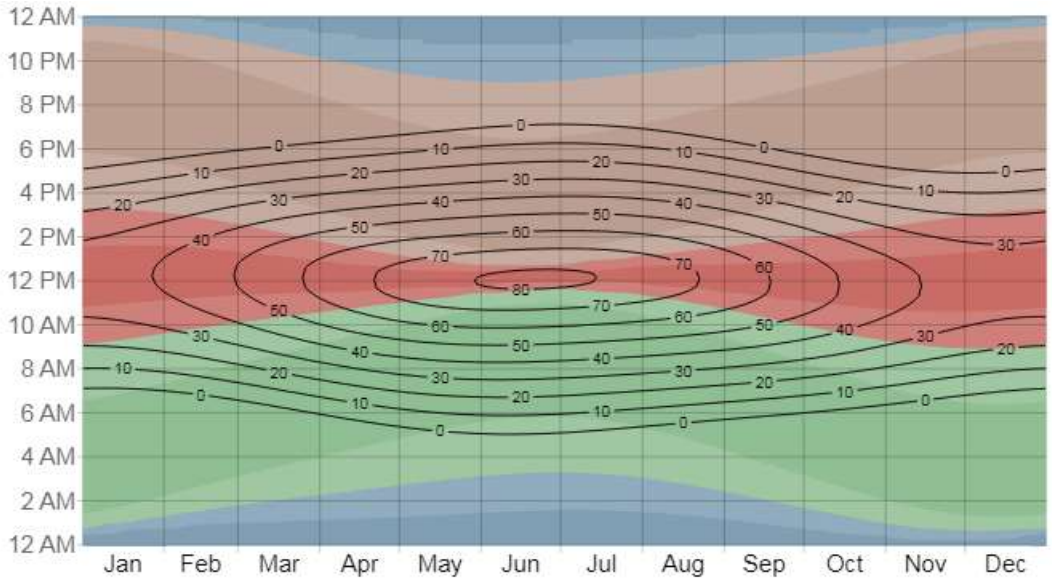

Figure 6.6 Solar Elevation Profile of Lahore

6.11 SEISMOLOGY

Pakistan Building Code distributes the country into 4-zones, fig. The project site falls in Moderate damage Zone, as such structural design of buildings and others will follow the applicable criteria for the zone. Seismic details are a very important consideration for any planning activity. As it directly lays impact on the construction of the site.

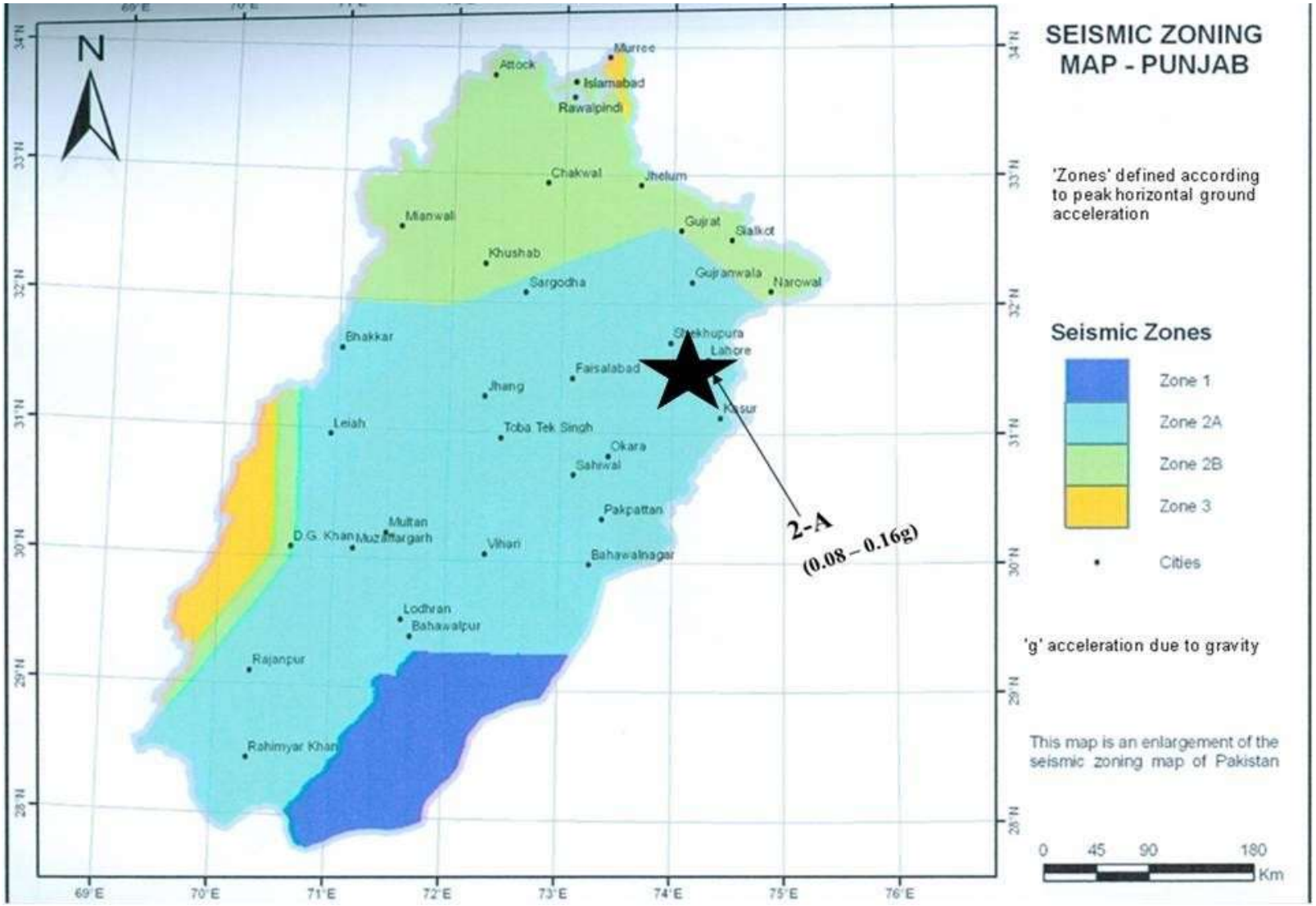

Figure 6.7: Seismic Zoning Map of Pakistan

6.12 FLOODING

No surface drainage problems are foreseen as surface water can be disposed of in the existing primary and secondary drainage network including partly moving into the sewerage.

6.13 WATER LOGGING AND SALINITY

There are no signs of water logging in the project site

6.14 ECOLOGICAL RESOURCES

As climate of Lahore is semi-arid and subtropical, the vegetation of the area falls under scrub, dry, tropical thorn forest type as per phyto-geographical classification of the area.

Due to rapid increase in the population of the city and to cater for its housing and commercial requirements, agricultural lands were converted into business centers, multi storey plazas and housing colonies.

6.14.1 MARINE AND AQUATIC ECOLOGY

This is not applicable to the Project area.

6.14.2 Flora

Lahore the city of gardens is heart of Pakistan. The city has seen the heydays of the Mughals, Sikhs and the British; all left their footprints on the history and cultural mosaic of the city. Resultantly Lahore is a treasure-trove of monuments, historical relics and remains which these nations have left in this historical metropolis of Punjab.

Though an ancient city; over the years Lahore has considerably expanded. However, along these modern additions, the ancient monuments, old gardens, trees, graveyards and traditional bungalows having attached gardens, large expanses of lawn and old roadside trees some of them can still be seen, are gradually disappearing. These green areas and old endemic trees of Lahore are home to many resident bird species as well as many summer, winter and transit migrants. So, Lahore is also very important due to its ecological conditions.

Several types of floral species are present in Lahore, however, some of the principal trees, shrubs (plants) and herbs (ground covering plants) are given below, which illustrates their nomenclature including local names, English names and Botanical names.

Table 6.3 Inventory of Trees Present in Lahore District

Serial No.	**Common Names**	**Botanical Names**
1.	Arjun	Terminalia arjuna
2.	Dhak	Butea frondosa

3.	Mahwa	Bassia latifolia
4.	Bahara	Terminalia bellerica
5.	Amaltas	Cassia fistula
6.	Gul-e-nishter	Erytrina subrosa
7.	Putajan	Putranjiva roxburgi
8.	Gab	Diospyores embryopteris
9.	Berna	Crateva religiosa
10.	Khark	Celtus australis
11.	Putajan	Putranjiva roxburgi
12.	Fiddle wood/Kashmir Lagotis	Eithrxyllum ruberratum
13.	Gul-e-mast	Dalinia indica
14.	Gul-e-mohr	Poinciana regia
15.	Alstonia	Alstonia scholaris
16.	Ashoke	Saraca indica
17.	Sheesham	Dalbergia sisso
18.	Alata	Stercolia colorata
19.	Kenair	Nerium grandiflora
20.	Weeping Willow	Salix babylonica
21.	Keekar	Parkinsonia aculeata
22.	Nilem	Jacaranda mimosfolia
23.	Kachnar	Bauhinia purpurea
24.	Molsary	Mimosop elengi
25.	Bel	Aegle marmelos

26.	Siris	Albizia lebbek
27.	Tun	Cedrela toona
28.	Jamin	Eugenia jambolana
29.	Moor pankh	Thuja orientalis
30.	Silkoak	Grevillea robusta
31.	Sufeda	Eucalyptus citriodora
32.	Peepal	Ficus relegiosa
33.	Simbal	Hyacinthus orientalis
34.	Berri	Diospyros melanoxylon
35.	Suk chain	Pongamia glabra
36.	Poplar	Populus alba
37.	Aam	Mangifera indica
38.	Shehtoot	Morus alba
39.	Peepal	Ficus relegiosa

6.14.3 Fauna

Common birds found in the area are crows and sparrows. Chirping birds are having their nests at the well-grown trees that are providing a natural habitat for the birds. Some squirrels, parrot, rats, weaver, sparrows are also found in the area.

Different species of reptile and amphibians such as lizards and frogs are also found. Various bird species known to occur in the area include myna, bulbul, crow and sparrow.

6.14.4 Endangered Species

There were no species reported by Forest and Wildlife Departments to be threatened, which are included in the IUCN Red Data Book.

6.14.5 Critical Habitats

No wild life sanctuary or game reserve (Critical Habitats), exists near the project area or the study area and therefore it can be stated that, this project does not affect any critical habitat as, no critical habitat is located close to the project area

6.15 SOCIOECONOMIC ENVIRONMENT

6.15.1 General

Lying between 31°15′—31°45′ N and 74°01′—74°39′ E, Lahore is bounded on the north and west by the Sheikhupura District, on the east by Wagah, and on the south by Kasur District. The Ravi River flows on the northern side of Lahore. Lahore city covers a total land area of 404 square kilometers (156 sq mi) and is still growing. With a rich history dating back over a millennium, Lahore is a main cultural center of Punjab and one of the most densely populated cities in the world. The city of Lahore remains an economic, political, transportation, entertainment, and educational hub. It is referred to as the "Mughal City of Gardens" due to the historic presence of gardens in and around the city dating back to the Mughal period.

6.15.2 Political and Administrative Setup

The project area falls in Lahore City of the Lahore District. District Co-ordination Officer is the highest ranked administrator of the district. For the collection of revenue and administration, the districts are subdivided into Tehsils. Local governments also administer the area through Union Councils and Tehsils. The total area of the district Lahore is 2,300 square kilometers.

6.15.3 Economy and Industrial Activities

As of 2008, the city's gross domestic product (GDP) by purchasing power parity (PPP) was estimated at $40 billion with a projected average growth rate of 5.6 percent. This is at par with Pakistan's economic hub, Karachi, with Lahore (having half the population) fostering an economy that is 51% of the size of Karachi's ($78 billion in 2008).

The contribution of Lahore to the national economy is supposed to be around 13.2%. As a whole, Punjab has $115 billion economy making it first and to date only Pakistani Subdivision of economy more than $100 billion at the rank 144.

Lahore's GDP is projected to be 102 billion$ by the year 2025, with a slightly higher growth rate of 5.6% per annum, as compared to Karachi's 5.5%. Central to Lahore's economy is the Lahore Stock Exchange (LSE), Pakistan's second largest stock exchange.

Lahore has offices of several Pakistani government corporations including the Water and Power Development Authority (WAPDA) and Water and Sewage Authority (WASA). Food and restaurant businesses remain open all night. Lahore is the second largest financial hub of Pakistan and has industrial areas including Kot Lakhpat and the new Sundar Industrial Estate (near Raiwand). Lahore's economic base is broad and varied.

Major industries include the manufacture of automobiles and motorcycles, Heavy machinery, railway coaches, home appliances, steel, telecommunications, information technology, chemicals, pharmaceuticals, computers, engineering, and construction material. A major industrial agglomeration with about 9,000 industrial units, Lahore

has shifted in recent decades from manufacturing to service industries. Some 42% of its workforce is employed in finance, banking, real estate, community, cultural, and social services. The city is Pakistan's largest software producing Centre and hosts a growing computer-assembly industry. Arfa Software Technology Park in Lahore is the biggest and most advanced IT park in the country.

Figure 6.7 Economic Units in Lahore

6.16 QUALITY OF LIFE VALUES

6.16.1 Demographic Characteristics of the Project Area

- The current metro area population of Lahore in 2022 is 13,542,000, a 3.41% increase from 2021.
- The metro area population of Lahore in 2021 was 13,095,000, a 3.58% increase from 2020.
- The metro area population of Lahore in 2020 was 12,642,000, a 3.72% increase from 2019.
- The metro area population of Lahore in 2019 was 12,188,000, a 3.83% increase from 2018

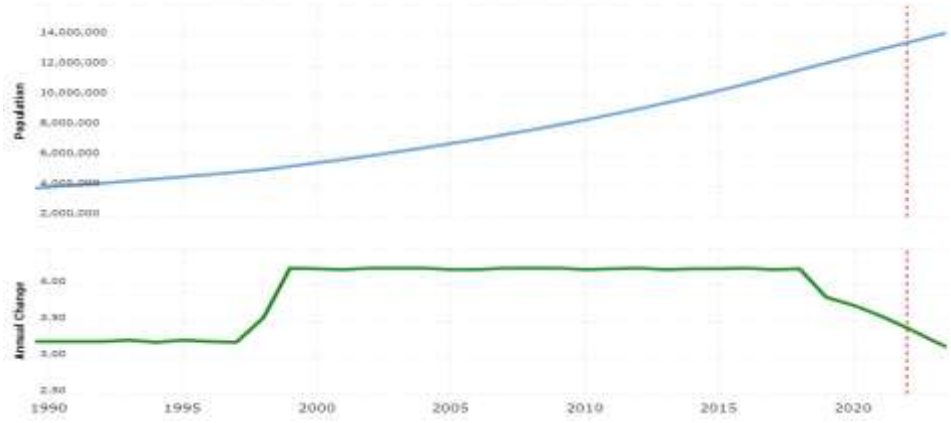

Figure 6.8 Graphical Representation of Intercensal Demographic Survey

Table 6.4 Intercensal Demographic Survey

Year	**Population**	**Annual Change**
1990	3970000	3.22
1991	4098000	3.22
1992	4230000	3.22
1993	4367000	3.24
1994	4507000	3.21
1995	4653000	3.24
1996	4803000	3.22
1997	4957000	3.21
1998	5133000	3.55
1999	5350000	4.23
2000	5576000	4.22
2001	5811000	4.21
2002	6057000	4.23
2003	6313000	4.23
2004	6580000	4.23
2005	6857000	4.21
2006	7146000	4.21
2007	7448000	4.23
2008	7763000	4.23
2009	8091000	4.23
2010	8432000	4.21
2011	8788000	4.22
2012	9160000	4.23

2013	9546000	4.21
2014	9949000	4.22
2015	10369000	4.22
2016	10808000	4.23
2017	11263000	4.21
2018	11738000	4.22
2019	12188000	3.83
2020	12642000	3.72
2021	13095000	3.58
2022	13542000	3.41

6.16.2 Rural and Urban Distributions

The urban population was 5,209,088 or 82.4 percent of the total population of the Lahore district, which grew at an average rate of 3.3 percent during 1981-98. The growth decreased from 3.7 percent, which was observed during 1972-81. There are one Metropolitan Corporation, two Town Committees and one Cantonment in the District.

There were 261 Mauzas (the smallest revenue unit) in 1998. Of these 61 had a population over 5 thousand, another 61 had 2 to 5 thousand, 64 had one to two thousand, and 74 had under one thousand persons while one was uninhibited.

6.16.3 Religion

The population of the district is predominantly Muslims i.e. 93.9 percent. The next higher percentage is of Christians with 5.8 points followed by Ahmadis 0.2 percent while other minorities like Hindu etc. are very small in number.

6.16.4 Ethnic Structure

The main castes and groups of the Lahore district are Arain, Jat, Rajput, Malik, Pathan, Mughal, Sheikh, Komboh and Gujjar. Besides, there are also village artisans, which include Lohars (blacksmiths), Tarkhan (carpenter), Kumhars (potters), Mochis (cobblers), Machhis (water-carrier), barbers and weavers etc.

6.16.5 Mother Tongue

The mother tongue refers to the language used for communication between parents and their children in any household. Punjabi is the predominant language being spoken by the majority (86.2 percent) of the population of the district followed by Urdu, Pushto, and Siraiki being spoken by 10.2, 1.9, and 0.4 percent. Sindhi is spoken by 0.1 percent.

6.16.6 Institutions

Lahore is the metropolitan city and a hub of various educational, academic and flourishing government institutes Educational facilities in Lahore are mainly being provided by the Government of Punjab, the city government and the private sector and voluntary organizations. To a limited extent the high school education is also being managed by the Federal Government through the operation of few institutes located in the cantonment area.

Of the total educated persons 12.6 % are below primary, 23.2 % had passed primary, 22.5 % middle, 18.2 % Matriculation, 9.3 % Intermediate, 7.2 % Graduates, 2.6 % Post graduates while 0.6 % were certificate holders.

Total number of Government schools in Lahore District is 409 out of which, 223 are boy schools and 186 are girls' schools while total number of students studying in these schools are 121,417 out of which, 46,625 are boys while 74,792 are girls. Similarly, total numbers of Municipal Corporation based schools in Lahore are 103 out of which, 44 are boy schools and 59 are girl schools. In these 44 boys' schools' total number of students is 4,575 and the total number of girl students is 9,606.

Similarly, there are number of colleges and universities are dealing with all fields of Science and arts. The Educational Facilities located at in Ferozepur Road include Beacon House School, Superior College, Central College, Kim's College, Hailey College, GC university Qurishi University, Punjab college, Quaid-e-Azam College, etc.

6.16.7 Transportation

The city of Lahore is one of the most accessible cities of the Punjab Province. In addition to the historic Grand Trunk Road (G.T. Road), a motorway (M- 2) was completed in 1997 from Lahore to Islamabad. The government has built underpasses to ease congestion and prevent traffic jams, and according to official figures, Lahore transportation services have improved to accommodate the growing number of visitors to the city. It is well connected by air to other countries as well as all major cities of Pakistan. Buses, trains, taxis, and rickshaws are the other means of transport available in Lahore.

Figure 6.9 Transportation in Lahore

6.16.8 Health Facilities

Ample medical and health facilities are available in the Lahore Metropolitan Corporation area and its suburbs. Shaukat Khanam Hospital is the latest addition in the

medical care facilities in Lahore for the most dangerous disease in the country. i.e. Cancer. There are also other hospitals of voluntary organizations which provide health cover to the general public. King Zaid Bin Sultan Hospital is also a very advanced addition in the medical care for Lahore. Among the prominent hospitals are General Hospital, Lady Willington Hospital, Mayo Hospital, Fatima Jinnah Hospital, The Children Hospital, Services Hospital, and Ganga Ram Hospital etc. Besides, a number of private medical practitioners, Hakims and homeopathic doctors are also practicing in the city. There is Masood Hospital, a famous private health facility located at Kalma Chowk.

6.16.9 Architecture Style

The most common places of interest in Lahore city are discussed as following;

a) Royal Fort Lahore

Royal Fort Lahore/Shahi Qila is located at an eminence in the north-west corner of the Walled City. The Citadel is spread over an area of 50 acres. Many visitors from the foreign and local tours of different educational institutions come to see this historical place every year. The front gate of the Fort is called the Alamgiri Gate of the Royal Fort.

b) Minar-e-Pakistan

About 59.5 meters tall monument, called Minar-e-Pakistan is situated near the Royal Fort in the spacious Iqbal Park (previously known as Minto Park), where the historical resolution for the creation of Pakistan was adopted on the 23rd March, 1940. Around the minar, there are spacious parks with beautiful Cyprus trees and flowers all over.

c) Badshahi Mosque

The imperial or the Badshahi Mosque is across the courtyard from Alamgiri Gate of the Royal Fort. It has beautiful gateway and a courtyard that is said to be the largest mosque courtyard in the world for outdoor prayers.

d) Lahore Museum

Opposite the old Punjab University Hall, a Mughal style building on the Shahrah-e-Quaid-e-Azam, houses the Lahore Museum. The Museum contains some fine specimens of Mughal and Sikh door-ways and wood work and has a big collection of paintings dating back to Indo-Pakistan, Mughal, Sikh and British times

It also has a collection of musical instruments, ancient jewelry, textile, pottery and armory. There are also relics from some Tibetan and Nepalese exhibits.

e) Shrine of Data Ganj Bakhsh

Close to the confluence of Lower mall and the Circular Road is the shrine of Data Sahib. Data Sahib was a great Sufi saint, which is well known work Kashf-ul-Mahjub has been translated from the original Persian version into Urdu and other several European languages and is considered a classic.

i) Shrine of Madhu Lal Hussain

This is the famous tomb in Lahore, where Mela Chiraghan is held on the last weekend of March and draws enormous crowds of devotees and others. The shrine is famous because of its antiquity and is revered by Muslims and Hindus alike.

6.16.9.1 Recreational/Entainment Places

f) Shalimar Garden

About 5 kilometers east of Lahore is the famous, Shalimar Garden laid out by the Mughal Emperor Shah-Jehan in 1642 A.D.

The Garden is spread out in typical Mughal Style and surrounded by high walls with watched-towers at the four corners. It covers an area of about 42 acres. Many people

from the entire city come to visit the park with their families at the weekend to spend their idle times.

j) Jallo Park

The Jallo Park is 28 kilometers from Lahore and located on the Lahore Branch Canal. Covering an area of 450 acres, it has expanses of lawns, a forest research centre, a children's park, zoo, small museum and gift shop inside.

6.17 CULTURAL VALUES

There is blend of poor and elite class among the residents of the project site. One can see a mixture of modern and old cultural values. Younger generation is fastly adopting modern cultural values of the affluent society. Elderly people are well respected and they even now play a decisive role in decision making in family matters. The liberal independence is also dominating now a day

7 SCREENING OF ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

7.1 GENERAL

This section identifies the potential impacts; related with design, construction and operation of the project on the physical, ecological and socio-economic domains of the environment.

Accordingly, mitigation measures have also been proposed to manage the environment and for sustainable development. Strict environmental management will be observed during the project construction and regular operation phases. Legal requirements of the PEPA and the PEQS will the rating standard for the activities. Compliance with the EMP and EMTP, as per recommendations in this EIA report will be adhered to with full spirit.

The project proponent is filing with the EPA Punjab, written Affidavit, and Undertaking on judicial papers, that the project throughout its life will operate under Environmental Management Order. Under these conditions, the project at its all stages including from construction to the regular operation will go in compliance with the PEQS. The project activities will, therefore, neither adversely affects the population nor the environment around the project site.

7.2 ENVIRONMENTAL PROBLEMS ASSOCIATED WITH DESIGN:

The design building has sought to minimize any environmental potential impacts by ensuring that the project should be in according to the environmental standards. Local aesthetic value is another issue to be considered during project design.

7.3 ENVIRONMENTAL PROBLEMS DUE TO LOCATION OF PROJECT

Environmental problems related to location of the project are mostly in the areas of physical setting, socioeconomic setting, ecological setting and special areas. Field survey revealed that the impacts of the project due to its location are mostly insignificant in nature.

7.4 ANTICIPATED ENVIRONMENTAL IMPACTS

During the field survey and consultation key impacts both positive and negative relating to the proposed project was identified. They were obtained by making physical observations at the project site as well as existing land use in the neighborhood.

7.4.1 Positive Environmental Impacts of Construction Activities

Creation of Employment Opportunities

Several employment opportunities will be created for construction workers during the construction phase of the project. This will be a significant impact since unemployment is currently quite high in the country at large.

Provision of Market for Supply of Building Materials

The project will require supply of large quantities of building materials most, of which will be sourced locally. This provides ready market for building material suppliers such as quarrying companies, hardware shops and individuals with such materials.

Increased Business Opportunities

The large number of project staff required will provide ready market for various goods and services, leading to several business opportunities for small-scale traders such as food vendors around the construction site.

Individual Investment

Economically, the project will be an investment to the proponent. The proposed project once complete can also be used as a collateral asset.

Optimal Use of Land

Subjected project leads to optimal use of land. Considering the scarcity of serviced land in Lahore, the project enhances the returns on the limited land space in the city.

Enhanced Security

During the operation of the project, security will be enhanced in the premise and the houses through distribution of suitable security lights and presence of a security guard. This will lead to improvement in the general security in the surrounding area.

Improved Infrastructure

Project activities will lead to improvement of transport, sewerage, water supply and telecommunication networks. Such services are a prerequisite to development in any region.

7.4.2 Negative Environmental Impacts of Construction Activities

Extraction and Use of Building Materials

Building materials such as hard core, ballast, cement, rough stone and sand required for construction of the building will be obtained from quarries, hardware shops and sand harvesters who extract such materials from natural resource banks such as rivers and land. Since substantial quantities of these materials will be required for construction of the buildings, the availability and sustainability of such resources at the extraction sites will be negatively affected, as they are not renewable in the short term. In addition, the sites from which the materials will be extracted may be significantly affected in several ways including landscape changes, displacement of animals and vegetation, poor visual quality and opening of depressions on the surface leading to several human and animal health impacts.

Mitigation Measure:

The proponent will source building materials such as sand, ballast and hard core from registered quarry and sand mining firms, whose projects have undergone satisfactory environmental impact assessment/audit and received environmental approval. Since

such firms are expected to apply acceptable environmental performance standards, the negative impacts of their activities at the extraction sites are considerably well mitigated.

To reduce the negative impacts on availability and sustainability of the materials, the proponent will only order for what will be required through accurate budgeting and estimation of actual construction requirements. This will ensure that materials are not extracted or purchased in excessive quantities. Moreover, the proponent will ensure that wastage, damage or loss (through run-off, wind, etc) of materials at the construction site is kept minimal, as these would lead to additional demand for and extraction or purchase materials.

In addition to the above measures, the proponent shall consider reuse of building materials and use of recycled building materials. This will lead to reduction in the amount of raw materials extracted from natural resources as well as reducing impacts at the extraction sites.

Dust Emissions

During construction, the project will generate substantial quantities of dust at the construction site and its surrounding. The sources of dust emissions will include site preparation and leveling works, and to a small extent, transport vehicles delivering building materials. Emission of large quantities of dust may lead to significant impacts on construction workers and the local residents, which will be accentuated during dry weather conditions.

Mitigation Measures:

Dust emission during construction will be minimized through strict enforcement of onsite speed controls as well as limiting unnecessary traffic within the project site. In addition, it is recommended that excavation works be carried out in wet weather; and traffic routes on site be sprinkled with water regularly to reduce amount of dust generated by the construction trucks.

Traffic flow during construction

There is a likelihood of increase in traffic on road adjacent to the site during construction (askari-5 road). The trucks will transport various building materials from their sources to the project site contribute to increases in emissions of CO2, NOx and fine particulate along the way as a result of diesel combustion. Such emissions can lead to several environmental impacts including global warming and health impacts. Because large quantities of building materials are required, some of which are sourced outside Lahore, such emissions can be enormous and may affect a wider geographical area. The impacts of such emissions can be greater in areas where the materials are sourced and at the construction site as a result of frequent running of vehicle engines, frequent vehicle turning and slow vehicle movement in the loading and offloading areas such trucks may slow down traffic flow

Mitigation Measures:

The proponent will put in place measures to address such concerns by ensuring that construction vehicles preferably deliver materials during off-peak hours when traffic volume is low. There will also be provision for caution signs on the access road to alert users on construction activities in progress in order to prevent occurrence of accidents. This will be achieved through proper planning of transportation of materials to ensure that vehicle fills are increased in order to reduce the number of trips done or the number of vehicles on the road. In addition, truck drivers will be sensitized to avoid unnecessary racing of vehicle engines at loading/offloading areas, and to switch off or keep vehicle engines at these points.

Noise and Vibration

The construction works, delivery of building materials by heavy trucks and the use of machinery/equipment including bulldozers, generators, metal grinders and concrete mixers will contribute high levels of noise and vibration within the construction site and the surrounding area.

Elevated noise levels within the site can affect project workers and the residents, passers-by and other persons in within the vicinity of the project site.

Mitigation Measures:

Noise and vibration will be minimized in the project site and surrounding areas through sensitization of construction truck drivers to switch off vehicle engines while offloading materials. In addition, they will be instructed to avoid gunning of vehicle engines or hooting especially when passing through sensitive areas such as churches, schools and hospitals. In addition, construction machinery shall be kept in good condition to reduce noise generation. It is recommended that all generators and heavy-duty equipment be insulated or placed in enclosures to minimize ambient noise levels.

Risks of Accidents and Injuries to Workers

Because of the intensive engineering and construction activities including erection and fastening of roofing materials, metal grinding and cutting, concrete work, steel erection and welding among others, construction workers will be exposed to risks of accidents and injuries. Such injuries can result from accidental falls from high elevations, injuries from hand tools and construction equipment cuts from sharp edges of metal sheets and collapse of building sections among others.

Health and safety of Workers on site

The proponent is committed to adherence to the occupational health and safety rules. In this regard, the proponent is committed to provision of appropriate personal protective equipment such as gloves; helmets, overall as well as ensuring a safe and healthy environment for construction workers by providing sanitary facilities (toilets) and portable water while food will be bought by workers from the nearby hotels.

Solid Waste Generation

Large quantities of solid waste (soil) will be generated as a result of excavation of the site. In addition, additional solid waste will be generated at the site during construction of the building and related infrastructure. Such waste will consist of metal cuttings, rejected materials, surplus materials, surplus oil, excavated materials, paper bags, empty cartons, empty paint and solvent containers, broken glass among others. Such solid waste materials can be injurious to the environment through blockage of drainage systems, choking of water bodies and negative impacts on human and animal health. This may be accentuated by the fact that some of the waste materials contain hazardous substances such as paints, cement, adhesives and cleaning solvents, while some of the waste materials including metal cuttings and plastic containers are not biodegradable and can have long-term and cumulative effects on the environment.

Mitigation Measures:

i. Use of durable, long- lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time.

ii. Provision of facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements.

iii. Purchase of perishable construction materials such as paints incrementally to ensure reduced spoilage of unused materials.

iv. Use of building materials that have minimal packaging to avoid the generation of excessive packaging waste.

v. Use of construction materials containing recycled content when possible and in accordance with accepted standards.

Water Use

The construction activities will require large quantities of water. Water will mainly be used for concrete mixing, curing, sanitary and washing purposes. Excessive water use may negatively impact on the water source and its sustainability.

Mitigation Measures:

The proponent shall ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water usage.

7.4.3 Positive Environmental Impacts of Operational Activities

Employment Opportunities

Some people will be employed by the project as management agents, caretakers, cleaners, security personnel and technicians.

Revenue to National and Local Governments

Through payment of relevant taxes, rates and fees to the government and the local authority, the commercial building will contribute towards the national and local revenue earnings.

Improved Security

Security will be ensured around the Houses through distribution of suitable security lights and presence of 24-hour security guards. This will lead to improvement in the general security in the surrounding area.

7.4.4 Negative Environmental Impacts of Operational Activities

Solid Waste Generation

The project is expected to generate enormous amounts of solid waste during its operation phase. The bulk of the solid waste generated during the operation of the project will consist of paper, plastic, glass, metal, textile and organic wastes. Such wastes can be injurious to the environment through blockage of drainage systems, choking of water bodies and negative impacts on animal health. Some of these waste materials especially the plastic/polythene are not biodegradable may cause long-term injurious effects to the environment. Even the biodegradable ones such as organic wastes may be injurious to the environment because as they decompose, they produce methane gas, a powerful greenhouse gas known to contribute to global warming.

Mitigation Measures:

The proponent will be responsible for efficient management of solid waste generated by the project during its operation. In this regard, the proponent will provide waste handling facilities such as waste bins and skips for temporarily holding domestic waste generated at the site. In addition, the proponent will ensure that such disposed of regularly and appropriately. After segregation, collection and handling waste will be transported and disposed-off by company providing services (Lahore Waste Management Company). It is recommended that the proponent put in place measures to ensure that the operational staff of the commercial building manages their waste efficiently by following 3R's (Reduce, reuse and recycling) formula.

Energy Consumption

During operation, proposed project will use a lot of electrical energy mainly for domestic purposes including lighting, cooking, running of air conditioning equipment, running of refrigeration systems, pumping water into reservoirs. Since electricity generation involves utilization of natural resources, excessive electricity consumption will strain the resources and negatively impact on their sustainability.

Mitigation Measures:

The proponent plans to install an energy-efficient lighting system for the project. This will contribute immensely to energy saving during the operational phase of the project. In addition, occupants of the building will be sensitized to ensure energy efficiency in their domestic operations. To complement these measures, it will be important to

monitor energy use during the occupation of the commercial and set targets for efficient energy use.

Water Use

The domestic activities during the operation phase of the project will involve the use of large quantities of water.

Mitigation Measures:

The proponent will install water-conserving automatic taps and toilets. Moreover, any water leaks through damaged pipes and faulty taps will be fixed promptly by qualified staff. In addition, the occupants of the commercial will be sensitized to use water efficiently.

7.5 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

As described above the worth mentioning wastes will be sewage and solid waste. In order to enhance environment, the following measures will be adopted:

7.5.1 Solid waste & Effluent management

Solid waste is likely to consist of household and organic waste from foodstuffs eaten. The proponent will address all waste in the following ways:

- Rainwater disposal will be done through the adequate system to be provided at all levels of the project building.
- Sewage will be discharged to the main sewerage system; after its treatment through a septic tank and also getting the permission from the competent authority.
- Sale of recyclables and reusable materials to minimize waste for disposal.
- Establishing a waste generation and collection register for tracking the disposal of waste.
- All hazardous chemicals will be stored in original containers for ease of identification and handling.
- Appropriate PPE will be provided, and usage at all times ensured, to the workers handling hazardous substances.

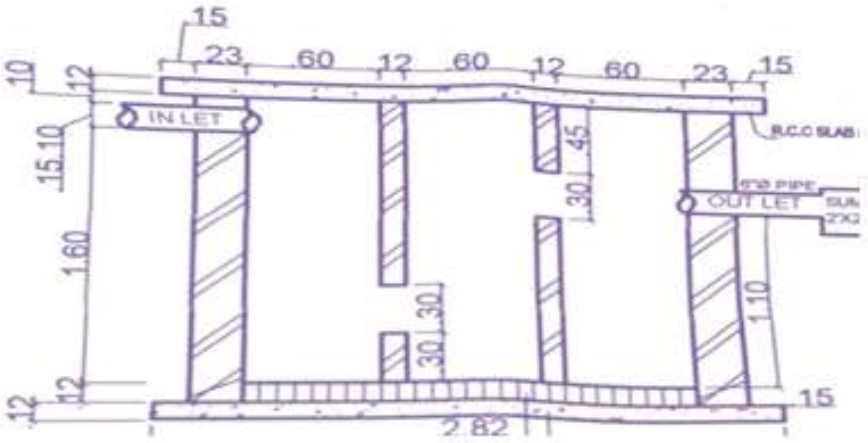

Figure 7.1 Design of Septic tank

8 ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

This EMP describes the mitigation and management measures to address the environmental issues during construction and regular operation and decommissioning phases of the proposed project.

8.1 OBJECTIVES OF ENVIRONMENTAL MANAGEMENT PLAN

The objectives of the EMP are as follow:

- To outline functions and responsibilities of responsible persons.
- To state standards and guidelines which are required to be achieved in the term
- To outline mitigation measures and environmental specifications which are required to be an implementation for all phase of the project in order to minimize the extent of environmental impacts and to manage environmental impact associated with the proposed project.
- To prevent long-term or permanent environmental degradation
- To identify training requirement at various levels

8.2 ENVIRONMENTAL MANAGEMENT PLAN

The EMP provides mitigation and management measures for the following phases of the project:

8.2.1 Construction Phase

This section of EMP provides management principles for the construction phase of the project. Environmental actions, procedures, and responsibilities as required within the construction phase are specified. These specifications will form part of the contract documentation and therefore, the contractor will be required to comply with the specifications to the satisfaction of the Project Manager and Environmental Control Officer, in terms of the construction contract.

8.2.2 Operation and Mitigation Phase

This section of EMP provides management principles for the operation and maintenance phase of the project. Environmental actions, procedure, and responsibilities are required from proponent within the operation and maintenance phase are satisfied.

8.2.3 Organogram for implementation Environmental Management Plan (EMP)

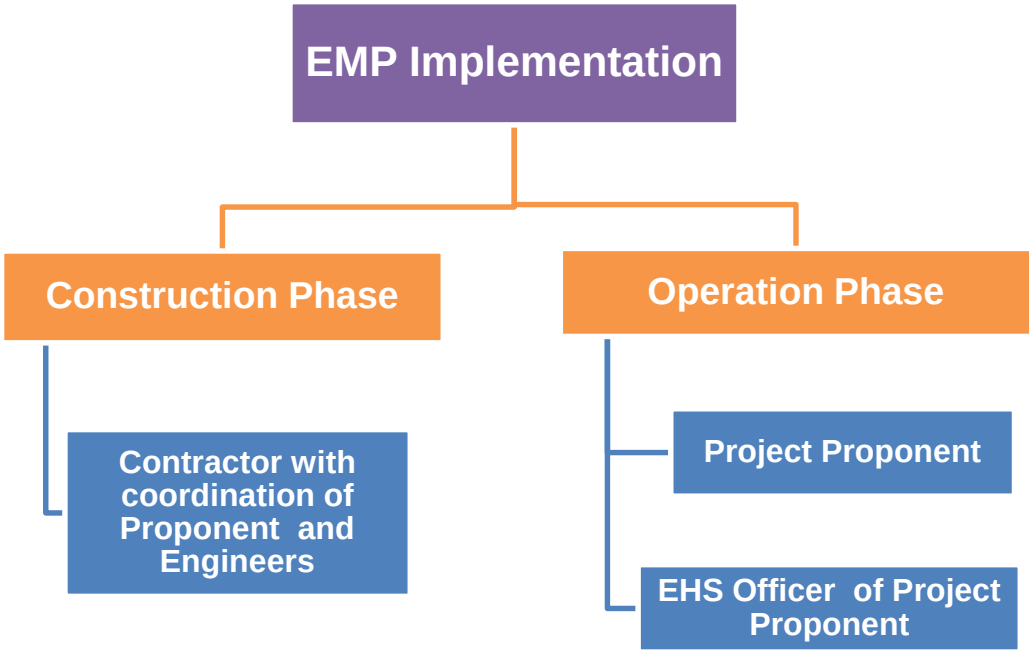

Table 8.1 Environmental Management Plan

Sr. No.	Project component/ impact	Project activities	Targets to be achieved	Mitigation/ Preventive Action	Responsibility	
					Implementation	Monitoring
Construction Phase						
1.	**Air Quality**	Storage, Handling, and Transport of Material	Compliance with prescribed PEQs to control air pollution	• Necessary measures like a sprinkling of water on a regularbasis, especially during dry climatic conditions, should be taken to limit pollution from dust and other windblown materials. • Periodic maintenance and management of all the construction machinery and vehicles • Waste burning will not be allowed.	During Construction Phase by Contractor with coordination of Proponent staff	Proponent/ EHS Officer
2.	**Water Quality**	Sanitation and wastewater disposal at campsite Storage, Handling and	Control of groundwater or surface water pollution from construction activities	• Use of spill prevention trays and impermeable sheets to avoid contamination of the groundwater/surface water • Furthermore, septic tanks will need to be constructed which	During Construction Phase by Contractor with coordination of Proponent staff	Proponent/ EHS Officer

Sr. No.	Project component/ impact	Project activities	Targets to be achieved	Mitigation/ Preventive Action	Responsibility	
					Implementation	Monitoring
		Oil spills due to rough handling of the materials. Stagnant water causes diseases and bad odor problems. Construction work on water body increases the risk to water quality.		will be cemented to prevent the groundwater contamination • Proper disposal of waste material on dumping sites to avoid leachate generation and contamination of groundwater/surface water • Prohibit illegal dumping of waste • The contractor will repair/replace / compensate for any damages caused by the Construction activities to the drinking water sources.		
3.	**Solid Waste**	Generation and Disposal of Solid waste near campsite. Dust and particulate matter emissions due to excavation digging and	Proper & safe handling and disposal of construction-related waste Compliance with applicable waste management rules for hazardous and	• Ensure prevention of inappropriate disposal of waste material. • Conduct separate collection of construction and domestic waste to promote recycling and re-use. • Dispose of non-recyclable and hazardous waste material	During Construction Phase by Contractor with coordination of Proponent staff	Proponent/ EHS Officer

Sr. No.	Project component/ impact	Project activities	Targets to be achieved	Mitigation/ Preventive Action	Responsibility	
					Implementation	Monitoring
		during other construction activities of building	non-hazardous waste disposal Implementation of waste management plan	properly according to waste management rules • Proper disposal of waste on agreed site as per agreed method. The area to be leveled and contoured after disposing of the excess material. No waste or debris will be thrown into the nearest canal water or other water bodies • The contractor will prepare waste management plan related to construction activities; get its approval from site engineer and ensure its full implementation.		
4.	**Noise**	Haulage Roots and Movement of Construction Vehicles. The use of heavy machinery and	Compliance with prescribed PEQS to control Noise pollution	• The contractor will strictly follow the PEQS for ambient noise • Control noise through control of working hours and selection of less noisy equipment. • Prohibit use of pressure horns	During Construction Phase by Contractor with coordination of Proponent staff	Proponent/ EHS Officer

Sr. No.	Project component/ impact	Project activities	Targets to be achieved	Mitigation/ Preventive Action	Responsibility	
					Implementation	Monitoring
		equipment causes noise. Noise generated by generator.		• Provision of acoustic enclosures (hood and shrouds) on generator • Proper maintenance of vehicles and construction equipment. • Minimize/avoid unnecessary use of pneumatic drills and other noisy machinery • The personal protective equipment (PPE) will be provided to the construction workers and its usage will be made mandatory		
5.	**Materials Management**	Transport of Hazardous Material (oils, Oil products). Storage areas for the hazardous material and other	Safe and secure environment for construction workers	• Stockpiles shall not be situated such that they obstruct natural water pathways • Stockpiles shall not exceed 2m in height unless permitted by Concerned Engineer on site • If stockpiles are exposed to windy conditions or heavy	During Construction Phase by Contractor with coordination of Proponent staff	Proponent/ EHS Officer

Sr. No.	Project component/ impact	Project activities	Targets to be achieved	Mitigation/ Preventive Action	Responsibility	
					Implementation	Monitoring
		construction material.		rain, they shall be covered either depending on the duration of the project. Stockpiles may further be protected by the construction of low brick walls around their bases • All substances required for vehicle/ machinery maintenance and repair must be stored in sealed containers until they can be disposed of / removed from the site • Hazardous substances/materials are to be transported in sealed containers or bags • Spraying of insecticide shall not take place under windy conditions		
6.	**Workers Health & Safety**	Risk of damage to worker health	Prevention of any possibility of work	• Provision of Personal Protective Equipment to the workers	During Construction Phase by Contractor	Proponent/ EHS Officer

Sr. No.	Project component/ impact	Project activities	Targets to be achieved	Mitigation/ Preventive Action	Responsibility	
					Implementation	Monitoring
		Risk of any damage by machine, chemicals, liquid waste etc. can be reduced by using safety signs at construction site and campsite	site accident /impact on worker's health	• Provision of first aid box at work site to cope with emergency situation • Safety training to the workers • Safe driving training to the drivers • Adequate safety signs on site • Provide training regarding proper handling and use of chemicals/ paints • Install fire extinguishers at fire handling places • Inspect and ensure that any lifting devices, such as cranes, are appropriate for expected loads • Any loss of public/ private property will be compensated by the contractor • Regular checks should be carried out to ensure a contractor's is following safe	with coordination of Proponent staff	

Sr. No.	Project component/ impact	Project activities	Targets to be achieved	Mitigation/ Preventive Action	Responsibility	
					Implementation	Monitoring
				working procedures and practices.		
7.	**Socio-economic Impacts**	Conflicts between locals may arise during construction activities	Prevention of conflicts among locals and make the project socially acceptable Empowerment of locals to possible extent by providing the job opportunities Increase in employment and business opportunities for locals.	• Contractor 's activities and movement of staff to be restricted to designated construction areas • The conduct of the construction staff when dealing with the public or other stakeholders shall be in a manner that is polite and courteous all the time • Lighting on the construction site shall be pointed downwards and away from oncoming traffic. • The site must be kept clean to minimize the visual impact of site • Machinery and vehicles are to be kept in good working order for the duration of the project	During Construction Phase by Contractor with coordination of Proponent staff	Proponent/ EHS Officer

Sr. No.	Project component/ impact	Project activities	Targets to be achieved	Mitigation/ Preventive Action	Responsibility	
					Implementation	Monitoring
				to minimize noise nuisance to neighbors • Noisy activities must be restricted to the times given in the Project Specification or General Conditions of contract • The Contractor is responsible for ongoing communication with those people that are interested in / affected by the projects Employ local residents as much as possible Promote communication between external workers and local people (e.g. join local events).		
8.	**Clearance of site from extra/ surplus material and**	The cutting of trees or flora of the site. Removing extra soil by	Restoration of site to a similar condition prior to the commencement of the work or to a condition agreed	Timely removal of waste from the site to avoid congestion at workplace.	During Construction Phase by Contractor with coordination of Proponent staff	Proponent/ EHS Officer

Sr. No.	Project component/ impact	Project activities	Targets to be achieved	Mitigation/ Preventive Action	Responsibility	
					Implementation	Monitoring
	construction equipment	excavation and digging	with the project management and landscaping of the site	Construction waste should be collected and disposed separately of other waste. Care will be taken during handling and disposal of waste. Contaminated soil (if generated) due to accidental spills will be removed and transported to the suitable site for disposal. Safe transportation of construction equipment from the site. The contractor must ensure that all structure, equipment, materials, and facilities used or created on site for/or during construction activities are removed. Empty/available space will be covered with grassy. Use of native vegetation as a part of the landscape.		

Sr. No.	Project component/ impact	Project activities	Targets to be achieved	Mitigation/ Preventive Action	Responsibility	
					Implementation	Monitoring
				Ornamental plant species like roses, jasmine, and seasonal flowers can be used in proposed landscaping, which is a common practice in this part.		
Operational Phase						
1.	**Solid waste**	The waste produced by the shops when in use. The waste produced is specifically the solid waste.	Compliance with waste management rules Proper Management of waste. Prevention of inappropriate waste disposal	• Solid wastes resulting from the building will be disposed of properly to avoid any threat to the environment. • The contractors to whom any waste recyclable material is to be sold shall be fully made aware of the environmental impacts and health effects of the waste to be sold to him if there is any.	EHS officer of Project Proponent	Proponent
2.	**Noise Impacts**	The noise generated due to the parking of vehicles, and standby	Compliance with prescribed PEQS to control Noise pollution	• Noise will be generated from the standby generator. • Proper covering of standby generator, to reduce the noise.	EHS officer of Project Proponent	Proponent/ EHS Officer

Sr. No.	Project component/ impact	Project activities	Targets to be achieved	Mitigation/ Preventive Action	Responsibility	
					Implementation	Monitoring
		generators in the areas.		• Noise reduction measures like buffering of noise through trees should be adopted where deemed necessary to reduce the noise level at the project boundary. • Mitigation measures during operation for noise impacts on workers will include standard occupational health and safety practices.		
3.	**Air Emissions**	The generator in use can cause the small contribution to the air emissions.	Ambient air quality (PEQS) standards, Prevention of air pollution in surrounding area	• Emissions will be generated from a standby generator. Scrubber system will be installed on generators to reduce the emissions or air fuel ratio will be adjusted as per the requirements	EHS officer of Project Proponent	Proponent/ EHS Officer
4.	**Water quality**	The proper disposal of the sewage water into the drains.	Compliance with Wastewater standards of PEQS	• Installation of septic tank so any wastewater produced complies with wastewater standards of PEQS • Runoff water is collected in the pond and after appropriate	EHS officer of Project Proponent	Proponent/ EHS Officer

Sr. No.	Project component/ impact	Project activities	Targets to be achieved	Mitigation/ Preventive Action	Responsibility	
					Implementation	Monitoring
				treatment will be utilized for horticulture		

8.3 Environmental management team along with their roles and responsibilities

Project Proponent will be responsible for the project activities. On the basis of need proponent will hire the personnel for environmental management at the site during operational phase of the project.

8.4 ENVIRONMENTAL MONITORING PROGRAM

The monitoring program is designed to ensure that the requirements of the NOC awarded by the EPA are met. Monitoring Program (MP) provides important information that allows for more effective planning and an adaptive response based on the assessment of the effectiveness of mitigation measures. The monitoring of various parameters will help to determine the extent to which project construction/operation activities will cause an environmental disturbance. Following is a tentative plan for environmental monitoring

Table 8.2 Environmental Monitoring Plan

Environmental segment/element	Monitoring parameters	Reference location/monitoring point	Monitoring frequency
CONSTRUCTION PHASE			
Water Quality	As prescribed by the Punjab environmental Drinking Water Quality Standards	Main Drinking Water Source	Quarterly
Ambient air emissions	Dust, smoke, PM, SO_x, NOx, CO, O_3	Use of generators, movement of materials, digging or excavation.	Quarterly
Wastewater including Sewage	Ensure that all wastewater is treated to the level set by the PEQS-Pakistan.	The sewage or sanitary wastewater by the campsite and use for other construction activities.	Quarterly
Noise	The Levels prescribed as in Punjab environmental quality standards	Noise produced by the machinery during construction work.	Quarterly
Solid Waste Disposal	Ensure that all wastes are disposed of according to	The waste material, rubble and solid waste	Quarterly

Environmental segment/element	Monitoring parameters	Reference location/monitoring point	Monitoring frequency
	legal requirements of the country.	produced by the campsite	
OPERATION PHASE			
Water Quality	As prescribed by the Punjab environmental Drinking Water Quality Standards, (PEQS)	Main Drinking Water Source	Quarterly
Ambient air emissions	carbon dioxide (CO_2), PM_{10}, CO, O_3	Generator Area	Quarterly
Wastewater including Sewage	Ensure that all wastewater is treated to the level set by the PEQS.	Final Disposal Site, drains	Quarterly
Solid Waste Disposal	Ensure that all wastes are disposed of according to legal requirements of the country.	solid waste, building disposal site	Regularly in connection with environmental and safety grounds
Noise	Noise levels	Generator and parking area	Once monthly at all involved places

8.5 ENVIRONMENTAL MANAGEMENT COST

The management cost that has to be spending on the mitigation measures has been estimated and is included in the following table.

Table 8.3 Environment Management Cost

Environmental Component	Quantity	Approximate Cost (PKR)
(i) Tree Plantation	800	250,000.0
(ii) Health and Safety Measures and Provision of PPEs	L.S.	400,000.0

Environmental Component	Quantity	Approximate Cost (PKR)
(iii) Air and Water Quality & Noise Monitoring	L.S.	500,000.0
(iv) Environmental Trainings	L.S	350,000.0
Total Environmental Management and Monitoring Cost		1,500,000.0

8.6 Proposed EMP Reporting and Reviewing Procedure

This section will specify institutional responsibilities for contractors, Borrower, local authorities, and EPA, with the roles that prepare, submit, receive, review, and approve the reports. An implementation schedule detailing the timing, frequency and duration of mitigation measures, monitoring, and reporting of the progress will be prepared, showing phasing and coordination with procedures in the project operations manual and loan agreement. Recipients of such reports will include those with responsibility for ensuring timely implementation of mitigation measures and for undertaking remedial actions. In addition, the structure, content and timing of reporting will be specified to facilitate supervision, review and approval (if necessary) by EPA.

The implementation of the EMP will be the prime responsibility of the project proponents who designate responsibilities and obligations to their selected contractors and staff. Monitoring, documentation and reporting the compliance components of the EMP will be the responsibility of proponent.

8.7 Any Training Needs Required to Ensure Implementation of EMP and Monitoring Plans

In order to effectively operate the EMP all the staff to be engaged in this activity will be trained extensively.

The person to monitor gaseous emissions, PM and noise levels would be extensively trained to handle his job capably. Training program will include use of monitoring instruments, data generation, processing, interpretation, recording, and presentation. Training of the workers would be done on quarterly basis.

9 TREE PLANTATION PLAN

The incorporation of a tree plantation plan within an EIA is of paramount importance for several compelling reasons. Trees play a pivotal role in environmental sustainability, acting as natural carbon sinks, enhancing biodiversity, and mitigating the impacts of climate change. A well-designed tree plantation plan contributes significantly to offsetting carbon emissions associated with a project, thereby fostering a more balanced and ecologically friendly footprint. Beyond their role in carbon sequestration, trees contribute to soil stabilization, preventing erosion and promoting water retention. They also provide habitat for diverse wildlife, supporting biodiversity conservation. Moreover, trees contribute to the improvement of air quality by filtering pollutants and releasing oxygen, thereby enhancing the overall health and well-being of surrounding communities. Integrating a tree plantation plan into the EIA showcases a commitment to ecological stewardship and reflects a proactive approach toward environmental sustainability, aligning the project with broader conservation goals and community well-being.

9.1 Objectives of tree plantation

The following objectives of tree plantation helps to clarify its basic purpose.

- ✓ Trees in urban areas provide shade and heat reduce heat, mitigation the urban heat island heat.
- ✓ Trees store carbon in their biomass, helping and reduce the atmospheric carbon dioxide levels.
- ✓ Trees contribute to visual appeal of urban and rural landscapes, making areas more attractive.
- ✓ Trees yield valuable resource such as timber, fruits, nuts, and medicinal plants.
- ✓ Trees plantations create employment opportunities for the people living in the vicinity of the project area.
- ✓ Trees act as a natural air filters by trapping airborne pollutants and particulate matter.
- ✓ Trees release oxygen during photosynthesis, improving air quality.
- ✓ Trees help maintain healthy watersheds, reducing the risk of floods and ensuring a consistent water supply.
- ✓ Trees help prevent soil erosion by anchoring soil with roots.
- ✓ Trees planted strategically can safeguard against landslides and protect roads and buildings.

- ✓ Trees absorb carbon dioxide and release oxygen, helping reduce greenhouse gas level and circumvent climate change.
- ✓ Trees can efficiently serve as windbreaks.

9.2 Benefits of Tree Plantation

A well-executed tree plantation plan offers numerous advantages, covering all the environmental, economic and soil aspects. Some of the key benefits of tree plantation are enlisted below;

- Plants absorb carbon dioxide (CO_2) from the atmosphere and store this carbon in the biomass helping to circumvent climate change by reducing greenhouse gas emissions.
- Roots of the trees help to stabilize soil and prevent soil erosion.
- Trees act as a natural air filter, by trapping particulate matter which leads to healthier living environments.
- Trees can provide habitat and food residues to birds contributing to local biodiversity.
- Trees act as a natural buffer that helps to control and purify water entering into the streams and rivers reducing the risks for the contamination of water.
- Well-maintained tree plantation enhances the visual appeal of the landscapes, making area more attractive.
- Tree roots can improve soil quality by increasing its organic matter content and nutrient availability.
- Tree plantation contribute to climate resilience by moderating temperature extremes, reducing the risk of heatwaves, and providing shelter from extreme weather events.
- Trees can help to enhance the mental and physical well-being of the people living around the project area.
- A well-designed tree plantation plan serves as a long-term investment in the environment and the future, as they continue to provide benefits for generations to come.

9.3 Area Enhancement Plan

Tree plantation plan of the area has been prepared keeping in view the project area and length. The plan is based on best possible estimations and can be modified accordingly at the execution stage.

9.4 Trees Recommended

Tree species are recommended for the plantation are the indigenous species of District Rawalpindi.

Table 9-1 Trees to be planted

Sr. No.	Local Name	Scientific Name
1.	Shisham	*Dalbergia sissoo*
2.	Keekar	*Acacia Arabica*
3.	Siris	*Albizzia lebbeck*
4.	Ber	*Ziziphus jujube*

9.5 COST OF TREE PLANTATION

The cost for the plantation and maintenance of trees at the project site is estimated as 3 Lakh PKR. The budget has been calculated for the procurement of manure, continued supply of water throughout the year. The proponent will make a proper record of the current number and conditions of the planted trees.

10 EMERGENCY RESPONSE PLAN & EVACUATION/EXIT PLAN

10.1 Objective of Emergency Response Plan

Emergency preparedness helps to minimize the human suffering and economic losses that can result from emergencies. It should be understood that the size and density of projects, as well as their access and location, have a bearing on the degree of planning necessary for emergencies. It is therefore strongly recommended that the constructor ensure that a member of staff on site assist in developing the emergency response plan.

10.2 Scope of Emergency Response Plan

This plan assesses risk, assign role and responsibilities and give the major steps to be followed in any emergency situation. Its increases understandings of workers and officials in handling different emergency situations which may occur at project area.

10.3 Emergency Situations

Following emergencies may occur at workplaces:

- Fire
- Gas leaks
- Explosions
- Injury from machinery and equipment
- Fall, climbing accident
- Emergency as a result of environmental conditions (e.g., heat, cold, wet, snow, wind, lightning, bushfires, floods) emergencies requiring evacuation
- Internal emergencies such as loss of power or water supply and structural collapse
- Serious injury events or medical emergencies
- Bomb threats
- Civil disorder or criminal acts such as robberies and shootings

10.4 General Evacuation Procedure

It is not always necessary to evacuate a unit/plant during an emergency. A power outage, for instance, does not necessarily call for evacuation of a unit. The overall safety of the unit must first be evaluated: lighting, hazardous materials, ventilation systems, and other hazardous operations. If the unit can be safely occupied, evacuation is not necessary. In the case of evacuation, the workers in the effected zone receive instructions from their supervisor or designated person. As per instruction the workers will immediately leave their places of duty and assemble at the assembly point.

- Area supervisor should roll call the employees to ensure all are out of danger zone.
- On receiving first information of emergency situation the administrative head should contact the Security Officer to ensure that alarm system is activated or not.
- After assessing the emergency situation Security Officer or designated person instruct through telephone to initiated the emergency response procedure and call the responsible personnel at site.

- Administrative Head may also call the external help like fire brigade, police, bomb disposal squad, ambulance etc. and communicate with them.
- Security Officer after consulting the Administrative Head may order the evacuation of workers from affected area.

If evacuation is ordered, follow these procedures:

- Stay calm, do not rush, and do not panic.
- Safely stop your work.
- Gather your personal belongings if it is safe to do so.
- If safe, close your door and window, but do not lock them.
- Use the nearest safe stairs and proceed to the nearest exit. Do not use the elevator.
- Wait for any instructions from emergency responders.
- Do not re-enter the building or work area until you have been instructed to do so by the emergency responders.

10.5 Fire Emergency Response Plan

a) Purpose

To minimize loss and injury, any type of fire, indoor or outdoor, should be reported to the fire department by calling given emergency contact number. Should there be a building fire, all building occupants are to be evacuated for their personal safety. Fire extinguishers have been provided within the building to extinguish small fires

b) Scope:

All employees are to be aware of the fire emergency plan and take prompt action according to the following procedure:

c) Procedure

i) **BE PREPARED**

Know the location of the fire exits, fire alarms, and fire extinguishers in your workplace. Familiarize yourself with the procedures below and participate in fire extinguisher training so that you are prepared in case of a fire. ‰

ii) IF YOU DISCOVER A FIRE

If you see or hear a fire, or smell smoke, pull the closest fire alarm. ‰

iii) TAKE IMMEDIATE ACTION AND DIAL EMERGENCY NUMBER

Dial 1122 or any emergency response number given by management, from a safe location and give the operator all the pertinent facts. When the operator answers, give the following information:

- Your name
- Phone number
- Location that you are calling from

- Give the precise nature of the fire, (i.e.: car fire, chemical fire, electrical fire, outdoor grass fire, building fire, fuel fire).
- Tell operator which entrance the fire truck should enter and describe our location.
- Indicate whether there are any injuries, number and extent of those injuries.
- DO NOT HANG UP until given permission to do so by the operator.
- Dispatch an employee to the entrance to guide the fire truck to the fire are

d) Use of Existing Equipment

You might try to put out the fire, if it is small enough, using existing equipment – use your best judgment (if trained and confident)

In the event that the fire is small enough to be extinguished by a fire extinguisher, fire extinguishers have been placed around the building and are identified. Become aware of the fire extinguisher locations and familiar with accessibility. If the fire does not go out or spreads after attempting to extinguish flames, leave the area immediately and close all doors on your way. ‰

e) Evacuation

If the fire is clearly out of control, notify all others in danger, YELL "FIRE" and evacuate all personnel from the building to the designated assembly station outside the building and help others in doing so. Leave buildings by the nearest safe exit. All employees, guests and visitors are to proceed to the designated assembly station in the employee parking area and ensure that their names are on a list of those who are out of the building. This list will be prepared by a designated fire response personal. Material Safety Data Sheets are to be taken by the responsible person and made available to the fire department, as required. All personnel are to wait outside the building as directed by the Fire Department. You are to re-enter the building only after the fire department has given permission to do so.

f) If your clothes catch fire

- Stop whatever you are doing.
- Drop to the ground.
- Roll to smother the flames.
- If someone else's clothes catch fire, have them stop, drop and roll.
- Try to smother the flames with a piece of clothing. ‰

g) Using an Extinguisher

- Pull the safety pin at the top of the extinguisher
- Aim the nozzle/hose at the base of the flames
- Squeeze or press the handle
- Sweep from side to side at the base of the fire until it is out

h) Know your Extinguisher

- Type A (green triangle) – use for paper and wood
- Type B (red square) – use for flammable liquids such as gas, oil, paint

- Type C (blue circle) – use for electrical fires involving wires or appliances‰

I) Notify Management

The manager, if not on-site, is to be notified immediately. Emergency numbers should be posted on an emergency contact list.

j) Responsibility

Fire supervisors are responsible to ensure everyone is out of the building and directed to the specified assembly station for a roll cal. Supervisors are to ensure that senior management has been notified of the fire, if not on location.

k) Fire Fighting Plan

A detailed fire fighting plan is mentioned in layout plan attached with this report as appendix. List of fire fighting equipments is described in Figure 6.1 below.

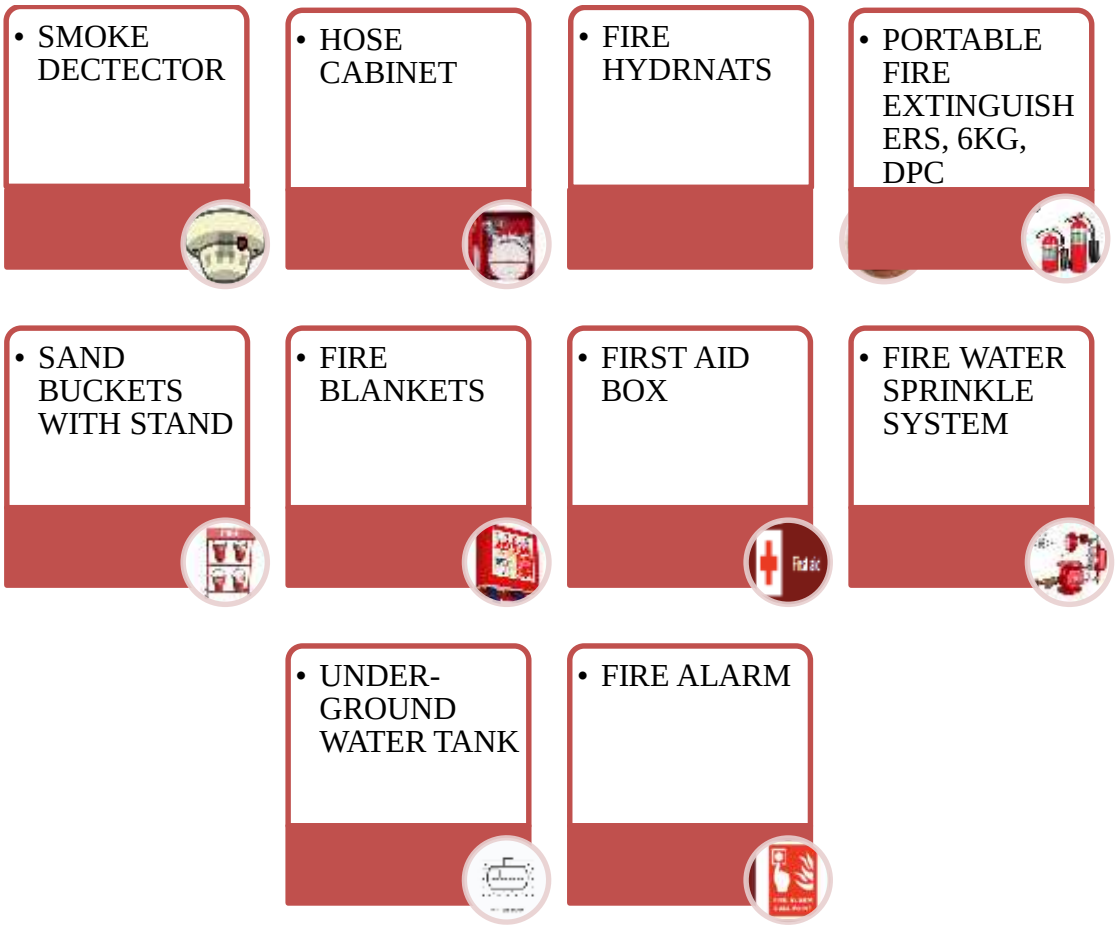

Figure 10.1 Fire Fighting Equipment

11 OCCUPATIONAL HEALTH AND SAFETY PLAN

The Occupational Health and Safety (OHS) plan holds paramount importance within the framework of an EIA. This plan is a comprehensive document that outlines strategies and protocols to safeguard the well-being of workers involved in the project. Beyond the ethical imperative of ensuring a safe working environment, the OHS plan is integral to regulatory compliance and risk management. It identifies potential occupational hazards associated with the project, establishes preventive measures, and details emergency response procedures. By incorporating an OHS plan into the EIA, not only is the health and safety of the workforce prioritized, but it also contributes to the overall success and sustainability of the project. A well-executed OHS plan minimizes the likelihood of accidents, injuries, and occupational health issues, fostering a workplace culture that values the welfare of its personnel. In essence, the OHS plan, as part of the EIA process, aligns with responsible and ethical project management, ensuring that occupational health and safety considerations are seamlessly integrated into the project's design, implementation, and ongoing operations.

11.1 Objectives of Occupational Health and Safety

The objectives of the Health and Safety plan are given below

- ✓ Protect the health and safety of employees, contractors, visitors, and the surrounding community. This includes preventing injuries, illnesses, and fatalities caused by chemical releases, explosions, fires, and other hazards.
- ✓ Minimize the environmental impact of chemical storage. This includes preventing the release of chemicals to the air, water, and soil.
- ✓ Comply with all applicable health, safety, and environmental regulations.

11.2 Scope of Occupational Health and Safety Plan

Following scope of occupational health and safety will be followed;

- Assessment and identification of potential hazards, including risks associated with handling, storage, transportation, and potential exposure to chemicals will be ensured.
- Detailed guidelines on the use, maintenance, and adequacy of personal protective equipment required for various tasks, such as flame-resistant clothing, safety goggles, gloves, respirators, and other specialized gear will be provided.

- Comprehensive training programs for workers, ensuring they are well-informed about the risks involved in working with chemicals, handling emergency situations, and the correct usage of safety equipment will be ensured.
- Detailed protocols and procedures for handling emergencies such as gas leaks, fires, and other incidents, including evacuation plans, communication strategies, and coordination with emergency services.
- Compliance with relevant occupational health and safety regulations and conducting regular audits to review and update safety protocols based on changing circumstances or regulations.
- Implementation of the regular maintenance schedules and inspections of equipment, machinery, and facilities to ensure safe working conditions and prevent potential hazards.
- Involving workers in safety decisions, creating a culture of safety awareness, and encouraging reporting of safety concerns or incidents will be implemented.

11.3 PERSONAL PROTECTIVE EQUIPMENT

The use of Personal Protective Equipment in a paper manufacturing plant is vital for safeguarding workers, ensuring regulatory compliance, mitigating risks, and promoting a culture of safety that is conducive to both employee well-being and operational excellence. The importance of Personal Protective Equipment (PPE) at a paper manufacturing plant cannot be overstated. Here are several key reasons highlighting the significance of PPE in this industrial setting:

- PPE provides a crucial line of defense against various occupational hazards prevalent in a paper manufacturing environment. It includes items such as safety helmets, gloves, safety glasses, and respiratory protection, which shield workers from potential injuries, chemical exposures, and airborne particles.

- Utilizing PPE is often a legal requirement and is mandated by occupational health and safety regulations. Adhering to these regulations not only ensures the safety of workers but also prevents regulatory penalties and legal issues for the manufacturing unit.

- Paper manufacturing involves machinery, chemicals, and processes that pose inherent risks. PPE serves as a risk mitigation strategy by minimizing the likelihood and severity of injuries or illnesses, contributing to a safer working environment.

- In the paper manufacturing process, workers may come into contact with various chemicals used in pulping, bleaching, and other stages. PPE, such as chemical-resistant gloves and protective clothing, safeguards workers from direct skin contact and potential harm.

- Dust and other airborne particles are common in paper mills. Respiratory protection, such as masks or respirators, is vital in preventing inhalation of harmful substances, promoting respiratory health, and minimizing the risk of respiratory-related illnesses.

- PPE not only prioritizes safety but also contributes to the overall comfort of workers. Comfortable and well-fitted PPE encourages adherence to safety protocols, fostering a positive work culture and enhancing overall productivity.

- In the event of unexpected incidents or emergencies, PPE can be crucial for protecting workers and mitigating the impact of accidents. Items like hard hats and steel-toed boots provide added protection during emergencies.

- Providing PPE demonstrates the employer's commitment to the health and safety of its workforce, instilling confidence and trust among employees. This, in turn, contributes to a positive work environment and employee morale.

11.4 PPE REQUIRED FOR CONSTRUCTION PHASE

During the construction of a project, including a paper manufacturing unit, a comprehensive set of Personal Protective Equipment (PPE) is necessary to safeguard the health and safety of workers involved in various tasks. The specific PPE requirements may vary based on the nature of construction activities, potential hazards, and regulatory standards. Here is a general list of PPE commonly required during construction:

Head Protection: Hard hats to protect against falling objects, impact, or head injuries.

Eye and Face Protection: Safety glasses or goggles to shield the eyes from dust, debris, or other airborne particles. Face shields for additional protection during tasks with a higher risk of facial exposure.

Hearing Protection: Earplugs or earmuffs to reduce exposure to loud noises, especially in areas with heavy machinery or construction equipment.

Respiratory Protection: Dust masks or respirators to protect against inhalation of dust, particulates, or hazardous substances.

Hand Protection: Safety gloves appropriate for the specific tasks, such as cut-resistant gloves, leather gloves, or chemical-resistant gloves.

Body Protection: High-visibility vests or clothing to enhance visibility, especially in areas with moving equipment. Reflective clothing for nighttime or low-visibility construction activities. Protective clothing, such as coveralls, for tasks involving exposure to hazardous substances.

Foot Protection: Steel-toed safety boots or shoes to protect against crushing injuries, falling objects, or punctures.

Fall Protection: Safety harnesses, lanyards, and other fall protection systems for workers operating at heights or in elevated areas.

Hand and Arm Protection: Elbow and knee pads for tasks that involve kneeling or crawling. Wrist support or braces for tasks with repetitive motions.

Weather Protection: Weather-appropriate clothing, such as rain gear, insulated clothing, or sunscreen, depending on the climate and weather conditions.

First Aid Kit: Access to a well-equipped first aid kit to provide immediate care for minor injuries.

Figure 11-1 PPEs for Construction Phase

It is essential for the construction project management to conduct a thorough hazard assessment to identify the specific risks associated with each construction activity and determine the appropriate PPE for the workers involved. Regular training, monitoring, and enforcement of PPE usage contribute to a safer construction environment.

11.5 SAFETY SIGNS DURING CONSTRUCTION PHASE

Safety signs serve as critical elements in maintaining a secure and hazard-free environment at construction sites. Their importance lies in their ability to effectively communicate potential risks and hazards to workers, visitors, and contractors. By providing clear information about safety procedures, required personal protective equipment, and safe work practices, these signs play a pivotal role in preventing accidents and injuries. Moreover, safety signs contribute to regulatory compliance, ensuring adherence to local regulations and occupational health and safety standards. They also serve as essential tools for emergency response by indicating the location of emergency exits, first aid stations, fire extinguishers, and other emergency equipment. In addition to their role in risk reduction, safety signs assist in site navigation, guiding individuals to specific areas and enhancing overall organization. Beyond practical benefits, safety signs contribute to fostering a culture of safety awareness among the workforce. They communicate important safety policies, promote compliance with site-specific regulations, and reduce the project's liability by showcasing a commitment to responsible

construction practices. Ultimately, safety signs are integral components in creating a safe, compliant, and organized construction site conducive to the well-being of all involved parties.

Figure 11-2 Safety signs for Constructional Phase

11.6 Personal Protective Equipment DURING OPERATIONLAL PHASE

Personal protective equipment (PPE) is an important part of any health and safety plan at aproject site. PPE can help to protect employees from a variety of hazards, including:

- PPE can help to protect employees from exposure to chemical vapors, which can be harmful to the respiratory system and can cause burns.
- PPE can help to protect employees from flying debris and from the heat and flames associated with an explosion.
- PPE can help to protect employees from burns and from exposure to smoke and toxic gases.
- PPE can also help to protect employees from other hazards, such as slips, trips, and falls.

11.6.1 PPE

PPE is crucial to ensure the safety of workers and minimize the risk of accidents. The necessary PPE for such environments typically includes:

1. **Safety Goggles/Face Shields:** Protect the eyes and face from potential splashes or contact with hazardous materials during filling or maintenance operations.
2. **Chemical-Resistant Gloves:** Shield hands from direct contact with chemicals, or corrosive substances used in the process to prevent skin irritation or burns.
3. **Flame-Resistant Clothing:** Clothing made of fire-resistant materials is essential to protect against potential fire hazards. This includes flame-retardant coveralls or other specialized clothing designed to resist ignition.
4. **Safety Shoes/Boots:** Non-slip, closed-toe footwear is important to protect the feet from spills, slips, or potential impact hazards.
5. **Respiratory Protection:** In some cases, respiratory masks or respirators may be required to safeguard against inhalation of fumes, vapors, or airborne contaminants.
6. **Hard Hats:** Essential for protecting the head from falling objects, particularly during maintenance or handling tasks where there is a risk of items falling from above.
7. **Ear Protection:** If the operations involve loud machinery or equipment, ear protection in the form of earplugs or earmuffs can prevent damage to hearing.
8. **Safety Harnesses:** In instances where workers are operating at elevated heights or working in confined spaces, safety harnesses can prevent falls and ensure worker safety.

The specific PPE vary based on the site's procedures, potential hazards, and regulatory requirements. Employees working in these areas should be trained in the correct usage of PPE and adhere to safety protocols to mitigate risks and ensure a safe working environment.

Figure 11-3 PPES for Operational Phase

12 STAKEHOLDERS CONSULTATION

12.1 GENERAL

This section describes the regulatory policy, planning and current practices of project proponent pertaining to the stakeholder engagements and outcomes of stakeholder consultation process initially done as part of the EIA report. The feedback from communities and other stakeholders directly or indirectly affected by the project is collected so that it may be used to adjust and improve the project's design, planning, implementation and help the implementation structure ensuring that the project is both environmentally and socially sound. The consultation process was carried out in accordance with the requirements of the Punjab Environmental Protection Act and Government of Pakistan on public consultation.

The objectives of this process were;

- To disseminate information on the project and its expected impact, long-term as well as short-term, among primary and secondary stakeholders,
- To gather information on relevant issues so that the feedback received could be used to address these issues at an early stage of the project,
- To determine the extent of the negative impacts of different project activities and suggest appropriate mitigation measures.

12.2 IDENTIFICATION OF STAKEHOLDERS

There are two types of stakeholders, i.e.

a. Primary stakeholders

b. Secondary stakeholders

12.2.1 Primary Stakeholders

The primary stakeholders are the initial stakeholders, such as affected persons, general public and women residing in the project area. Accordingly, the consultations / focus group discussions were made with all primary stakeholders for sharing of information about the proposed project and expected impacts and understanding about the concerns by category of stakeholders.

12.2.2 Secondary Stakeholders

The secondary stakeholders are the representatives of Government Departments/Agencies involved in the planning, design, implementation and operation of the project, including various government departments such as District Administration, Lahore Development Authority, EPA, WAPDA, WASA, and other relevant departments.

12.3 STAKEHOLDER CONSULTATION PROCESS

The overall strategy for stakeholder's consultation is as follows:

Table 12.1 Process of Stakeholder Consultation

Stakeholders	Purpose of Consultations	Methodology	Stage
Primary Stakeholder	• Information gathering and data collection. • Information sharing about the project (disclosure) • Opinion seeking (concerns and expectations)	• Focus Group Discussions • Household surveys • Formal and informal Community meetings	• Base line Study Impact Assessment
Secondary Stakeholder	• Participation in the development process • Information gathering • Authentication and validation of the development processes • Verification of the record	• One on one meetings • In-depth interviews	• During the EIA preparation • On need basis during the project implementation and

Stakeholder consultation for this project was planned during the preparation of EIA report. In first step during the scoping, which has already taken place, consisted of meetings with individuals, groups, relevant organizations and government departments, which are in some way linked to the project and therefore considered stakeholders. The meetings were conducted to inform stakeholders about the project and how it may affect their lives/activities, and to record their concerns, whether real or perceived. Through the use of various tools, the study team tried to involve the stakeholders in active decision-making. The results of this exercise are described below, where mitigation measures have been developed addressing the pertinent stakeholder concerns.

12.4 PROPONENT

All possible impacts and mitigation measure related to the project were discussed with the proponent and management. They assured to take all suggested mitigation measures to control any discrepancy arose by the project and to make the project environment friendly.

12.5 THE RESPONSIBLE AUTHORITY

The management of Mixed-Use Building shall be the responsible authority to take all measures prior to start the project and during operation.

12.6 OTHER DEPARTMENTS AND AGENCIES

For the impact analysis detailed with the management, local community, educational institutes, health institutes, hospitals and NGOs. All issues were discussed related to implementation of the project. Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area.

12.7 ENVIRONMENTAL PRACTITIONERS AND EXPERTS

Team of Integrated Environment Consultants visited the project site, had discussion with stakeholders and consulted with the local people of nearby and other areas to evaluate the project socio-economic impacts. People of the area belong to different professions like mostly belong to employment, own businesses, doctors, some of them communicated but according to social value of the area they mostly hesitate to communicate comfortably and get pictured. People provide the massive information about the project and have positive remarks regarding the project development.

12.7.1 Affected and Wider Community

There is no affected community present in the area of proposed project. Consultant's team has consulted with the inhabitants of different Areas. The remarks of people are positive regarding the project and people foresee positive impacts like employment opportunities, development of the area etc.

12.8 COMMUNITY CONCERNS

12.8.1 Project Approval

The community consultations demonstrated that goodwill towards the project proponents indeed exists; approval for project activities by the communities was evident. The consultations were considered a good gesture and appreciated, especially by the men and women. This project will provide employments to the local as well as non-local poor community in its construction as well as in operational stages. The project also approved NOC from WASA and LDA.

12.8.2 Resettlement/ Relocation

The proposed site is located on the land already owned by proponents of the project. Therefore, no issue of the resettlements is there.

12.8.3 Local Employment

Communities in the project area emphasized that local poor community should be given priority when employing people for various project-related works and activities according to their skills.

12.8.4 Interaction with Local Community

Non-Local work force coming in the project area that will not be aware of the local customs and norms, may result in conflicts with the local community, keeping in mind the sensitive law and order situation and culture of the area.

12.9 RELEVANT LEGISLATION

Punjab Environmental Protection Act 2012 (Amended Act)

Public consultation is mandated under Punjab's environmental law. The Provincial Agency, under Regulation 6 of the IEE-EIA Regulations 2022, has issued a set of guidelines of general applicability and sectoral guidelines indicating specific

assessment requirements. This includes Guidelines for Public Consultation, 1997 (the 'Guidelines'), that are summarized below

Table 12.2 Framework of Consultation:

Objectives of public involvement	The main aim is to inform the public regarding the proposed project.
Stakeholders	The important stakeholders involve the local or affected community, proponents, local government and NGO's.
Mechanism	Gathering of the relevant information, listening and reviewing the complaints of stakeholders that leads to the decision making.
Timing and frequency	Should be started during screening of the project
Consultation tools	The important tools involved focus group meetings, workshops or formal and informal interviews.
Important consideration	Objectives of the study, to seek alternatives through consultation, and identification of stakeholders and the required mechanisms.

12.10 DISCUSSED POINTS

The points that have been kept in view while consulting stakeholders are as follows:

- Activities of the project and their consequences.
- Requirements of the people likely to be affected.
- Mitigation measures or compensation strategies.
- Role of the affected people in the implementation and development of the project.

13 Grievance Redress Mechanism

A Grievance Redress Mechanism is a structured system established to address and resolve complaints, concerns, or issues raised by individuals or entities regarding their experiences or interactions. This mechanism typically involves clear channels for lodging complaints, whether through written communication, online platforms, or dedicated grievance officers. Once a grievance is registered, the mechanism ensures a systematic and fair investigation of the matter, taking into account all relevant information and perspectives. Timely resolution and effective communication with the aggrieved party are essential components, helping to restore trust and rectify any perceived injustices. An efficient Grievance Redress Mechanism not only safeguards the rights and interests of individuals but also contributes to organizational transparency, accountability, and continuous improvement in service delivery.

13.1 OBJECTIVES OF GRIEVANCE REDRESS MECHANISM

The objectives of a GRM are designed to provide an effective and transparent process for addressing and resolving complaints or grievances raised by individuals or entities affected by a project or organization. The key objectives of a Grievance Redress Mechanism include:

- Ensure that the grievance redress process is easily accessible to all stakeholders, providing a straightforward means for individuals or communities to voice their concerns.
- Promote a fair and impartial mechanism that treats all grievances with equal consideration, regardless of the stakeholder's background, status, or affiliation.
- Establish a system that addresses grievances in a timely manner, minimizing delays and providing prompt resolution to concerns to prevent prolonged dissatisfaction.
- Foster transparency in the grievance redress process, ensuring that stakeholders are informed about the status of their complaints and the steps taken to address them.
- Hold the organization or project accountable for addressing and resolving grievances in accordance with established policies and procedures.
- Utilize the grievance redress process as an opportunity for organizational learning, collecting feedback to identify areas for improvement in project implementation or organizational practices.
- Empower affected individuals or communities by giving them a voice in the decision-making process and acknowledging the importance of their concerns.

- Serve as a mechanism for resolving conflicts and disputes in a constructive manner, minimizing the potential for escalation and promoting harmonious relationships.
- Use insights gained from the grievance redress process to enhance project design, implementation strategies, and overall organizational practices for continuous improvement.
- Ensure that the grievance redress mechanism aligns with legal requirements, industry standards, and the principles of social responsibility.
- Strengthen community engagement by demonstrating a commitment to addressing concerns and maintaining open communication channels.

By achieving these objectives, a Grievance Redress Mechanism contributes to building trust, fostering positive relationships with stakeholders, and enhancing the overall social and environmental sustainability of a project or organization.

13.2 Components of GRM

GRM typically involves several basic steps to address and resolve complaints or grievances effectively. While specific procedures may vary depending on the organization or context, the following are common steps in a basic GRM:

- Individuals submit their grievances through designated channels, which may include online platforms, written communication, or direct contact with a grievance officer.

- The received grievance is formally registered in the system, assigning a unique identifier. This step ensures proper tracking and documentation of each complaint.

- A preliminary assessment is conducted to determine the nature and severity of the grievance. This step helps in categorizing grievances and prioritizing them based on urgency.

- A thorough investigation is carried out to gather relevant information and facts related to the grievance. This may involve interviews, document reviews, or other means of inquiry.

- Clear and timely communication is maintained with the aggrieved party throughout the process. Regular updates and feedback are provided to keep them informed about the progress of the investigation.

- Once the investigation is complete, appropriate measures are taken to address the grievance. This may involve corrective actions, policy changes, compensation, or other forms of redress, depending on the nature of the complaint.

- The resolution is communicated to the aggrieved party, and feedback is sought to ensure their satisfaction. Follow-up may be conducted to confirm that the resolution has been implemented and to monitor any lingering concerns.

- The entire process, from grievance registration to resolution, is documented for record-keeping and reporting purposes. This documentation aids in analyzing trends, identifying systemic issues, and improving the overall grievance-handling process.

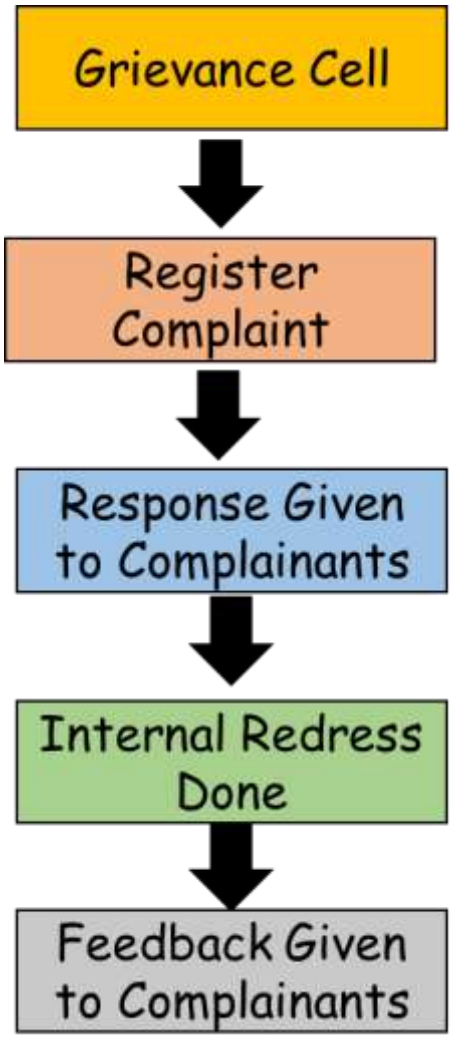

Figure 13-1 Grievance Redress Mechanism

14 CONCLUSION AND RECOMMENDATIONS

Based on the study conducted for Environmental Impact Assessment (EIA) of the project, the following recommendations are made:

- Plantation as far as permissible and within the scope of the project is carried out.
- Sustainable development approach through conservation of the natural environment is followed.
- Environmental aspects of the project should be well-taken care through implementation of the Environmental Management Plan as recommended in this report.
- Quarterly monitoring of all-out environmental pollution sources by a third party would be required who will also certify that the project is running in accordance with legal requirements

On the basis of the findings of the EIA, it is concluded that the construction of the commercial Building at 3-Sulatn Town Raiwind, Lahore. Project will not pose any adverse impact on the local population and the environment. Therefore, it is recommended that the competent authority may please be issues Environmental Approval for the construction and operation of this project.

REFERENCES

Listed below are some of the documents, reports and other references consulted during the preparation of this report:

- Information and data provided by project proponents;
- Project Pre-feasibility Study Report;
- Technical Design Data related to the project.
- Information gathered through discussions with the project related persons of the project proponent;
- Information collected from the Technical documents of various suppliers of machinery/equipment.
- Punjab Environment Quality Standards for Ambient
- Punjab Environment Quality Standards Noise Levels
- Punjab Environment Quality Standards for Drinking Water
- Pakistan Environmental Protection Act, 1997;
- The Punjab Environmental Protection (Amendment) Act 2012 covers aspects related to:
- The protection, conservation, rehabilitation and improvement of the environment and the prevention, control of pollution and promotion of sustainable development;
- Establishing complete regulatory and monitoring bodies, policies, rules, regulations and national environmental quality standards; and
- To ensure enforcement, the act establishes regulating bodies i.e. Punjab Environmental Protection Council (PEPC) and responsible bodies i.e. Punjab Environmental Protection Agency (Punjab EPA) at Provincial level.
- Environment-related Laws in Pakistan and the Province of Punjab;
- Government of Pakistan, Pakistan Environmental Protection Agency, Policy and Procedures for Filing, Review, and Approval of Environmental Assessment, 2022;
- Guidelines for Public Consultations –
- These guidelines cover:
- Consultation, involvement, and participation of Stakeholders
- Techniques for public consultation (Principles, levels of involvements, tools, building trust)
- Effective public consultation (planning, stages of EIA where consultation is appropriate)
- Workplace safety and health act 2011

- Land Acquisition Act (LAA) of 1894
- Pakistan Penal Code, 1860

TERM OF REFERENCES

- The Consultant is required to carry out an Environment Assessment Study of the Project as required under section 12 of Pakistan Environmental Protection Act 1997/ Punjab Environmental Protection (Amendment) Act 2012.
- The Study should be comprehensive and should cover all aspects which are envisaged under the relevant national and provincials' laws & regulations including but not limited to:
- Identification and recommendation for suitable solution/treatment/mitigation measures of emissions and effluents such as wastewater and sludge etc in accordance with Punjab Environmental Quality Standards (PEQS).
- Identification and recommendation for suitable solution/treatment/mitigation measures of solvents, oils (tar), hazardous waste, organic compounds, steam, flue gases, particulate matter and chemical compounds harmful for the environment and other substances leading to air, noise, water and soil pollution in accordance with PEQS.
- The Study should be acceptable to the relevant national and/or provincial authorities (relevant authorities) in Punjab.

GLOSSARY

Air Quality	Measurement of the pollutants in the air; a description of healthiness and safety of the atmosphere.
Area	Area is the quantity that expresses the extent of a two-dimensional figure or shape, or planar lamina, in the plane.
Basement	A basement or cellar is one or more floors of a building that are either completely or partially below the ground floor.
Building	Building is a usually roofed and walled structure built for permanent use.
Compensation	Includes cash payment, deferred payment, a bond, an insurance policy, stipend, payment in kind, rendition of services, grant of privileges and disturbance money, entitlement to special treatment by government and semi government entities, grant of alternative land, grant of import licenses and business, trade and commercial facilities in addition to the rehabilitation and resettlement of an affected person.
Commercial Building	Commercial buildings are buildings that are used for commercial purposes, and include office buildings, warehouses, and retail buildings
Consultation	Consultation refers to two-way transfer of information or joint discussion between project staff and the affected population. Systematic consultation implies a sustained and rigorous sharing of ideas. Bank experience shows that consultation often yields the best resettlement alternatives, fruitful procedures for continued participation, and independent information on actual conditions for implementation.
Coordinates Contaminate	Each of a group of numbers used to indicate the position of a point, line, or plane to make impure, pollute
Disclosure	The action of making new or secret information known
Disruption	Disturbance or problems which interrupt an event, activity, or process.
Environmental Management	Attempt to control human impact on and interaction with the environment in order to preserve natural resources
Evaluation	The making of a judgment about the amount, number, or value of something; assessment.
Geology	A science that studies rocks, layers of soil, etc., in order to learn about the history of the Earth and its life

Ground Water	Aquifers currently being used as a source of drinking water or those capable of supplying a public water system. They have a total dissolved solid content of 10,000 milligrams per liter or less, and are not "exempted aquifers.
Hazardous	Substance or material, which could adversely affect the safety of the public, handlers or carriers during transportation
Household	People residing under one roof, using the same hearth and operating as a single economic unit.
Impact	Effect on someone or something
Land Acquisition	The process whereby a person is compelled by a public agency to cede all or part of the land a person owns or possesses, to the ownership and possession of that agency, for public purpose in return for compensation.
Lobby	Lobby is a room providing a space out of which one or more other rooms or corridors lead, typically one near the entrance of a public building.
Mitigation	The action of reducing the severity, seriousness, or painfulness of something
Occupational Health	Maintenance of the highest degree of physical, mental and social well-being of workers in all occupations by preventing departures from health, controlling risks and the adaptation of work to people, and people to their jobs
Parking	A parking garage is a building, or an area under a building, where cars can be parked.
Project Area	The area specified by the funding and/or implementing agency according to the Official Gazette Notification and includes the areas within the administrative limits of the Federal or a Provincial Government.
Proponent	A person who advocates a theory, proposal, or course of action.
Rehabilitation	Include all compensatory measures to re-establish; at least lost incomes, livelihoods, living and social systems. It does not include the payment of compensation for required assets.
Resettlement	Means all measures taken to mitigate any and all adverse impacts, resulting due to execution of a project on the livelihood of the project

	affected persons, their property, and includes compensation, relocation and rehabilitation.
Social Environment	It includes the culture that the individual was educated or lives in, and the people and institutions with whom they interact.
Scope	The extent of the area or subject matter that something deals with or to which it is relevant
Stakeholders	Include affected persons and communities, proponents, private and public businesses, NGOs, host communities and EPA.
Topography	Details of the surface features of land. It includes the mountains, hills, creeks, and other bumps and lumps on a particular hunk of earth.